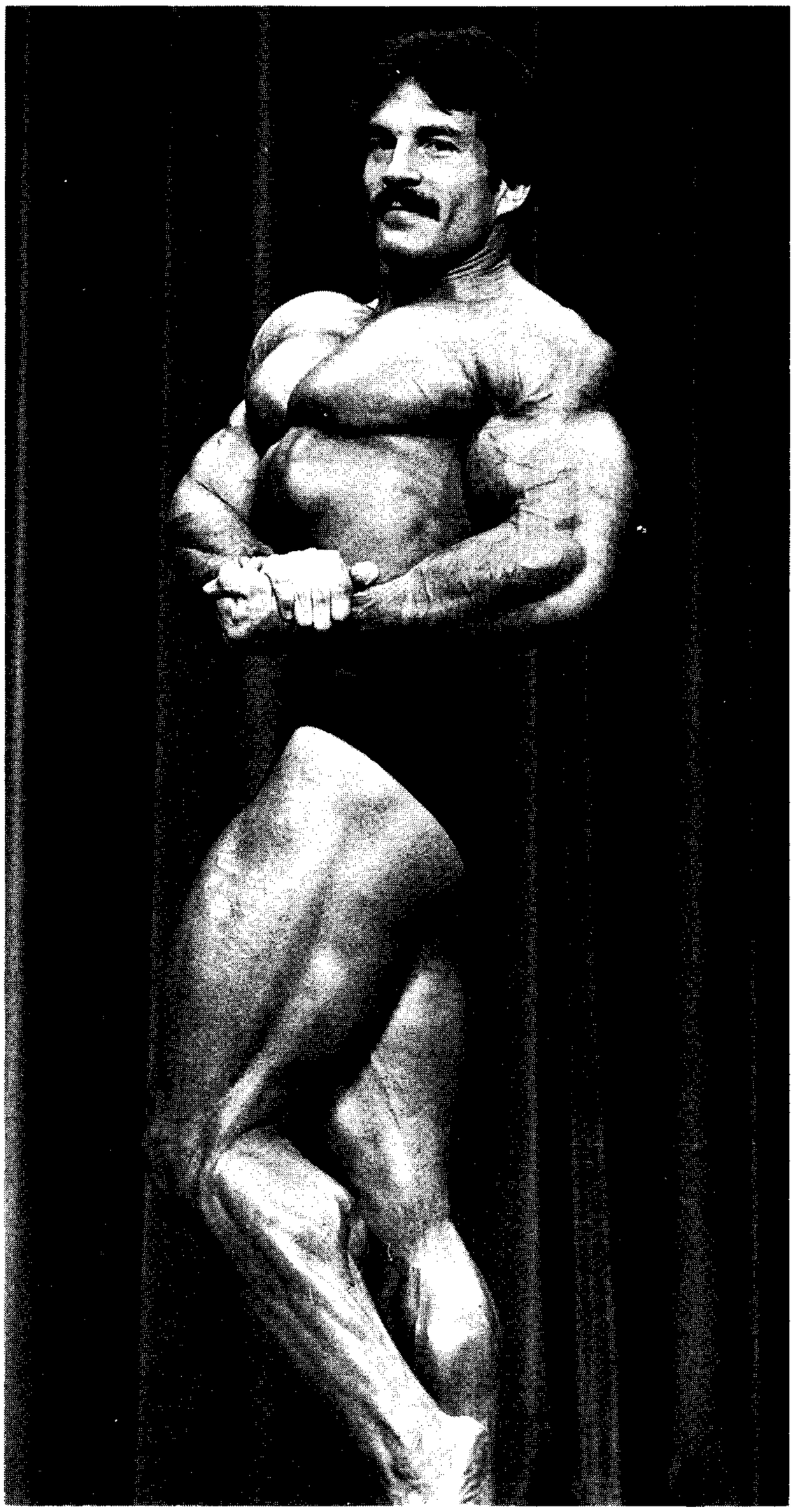
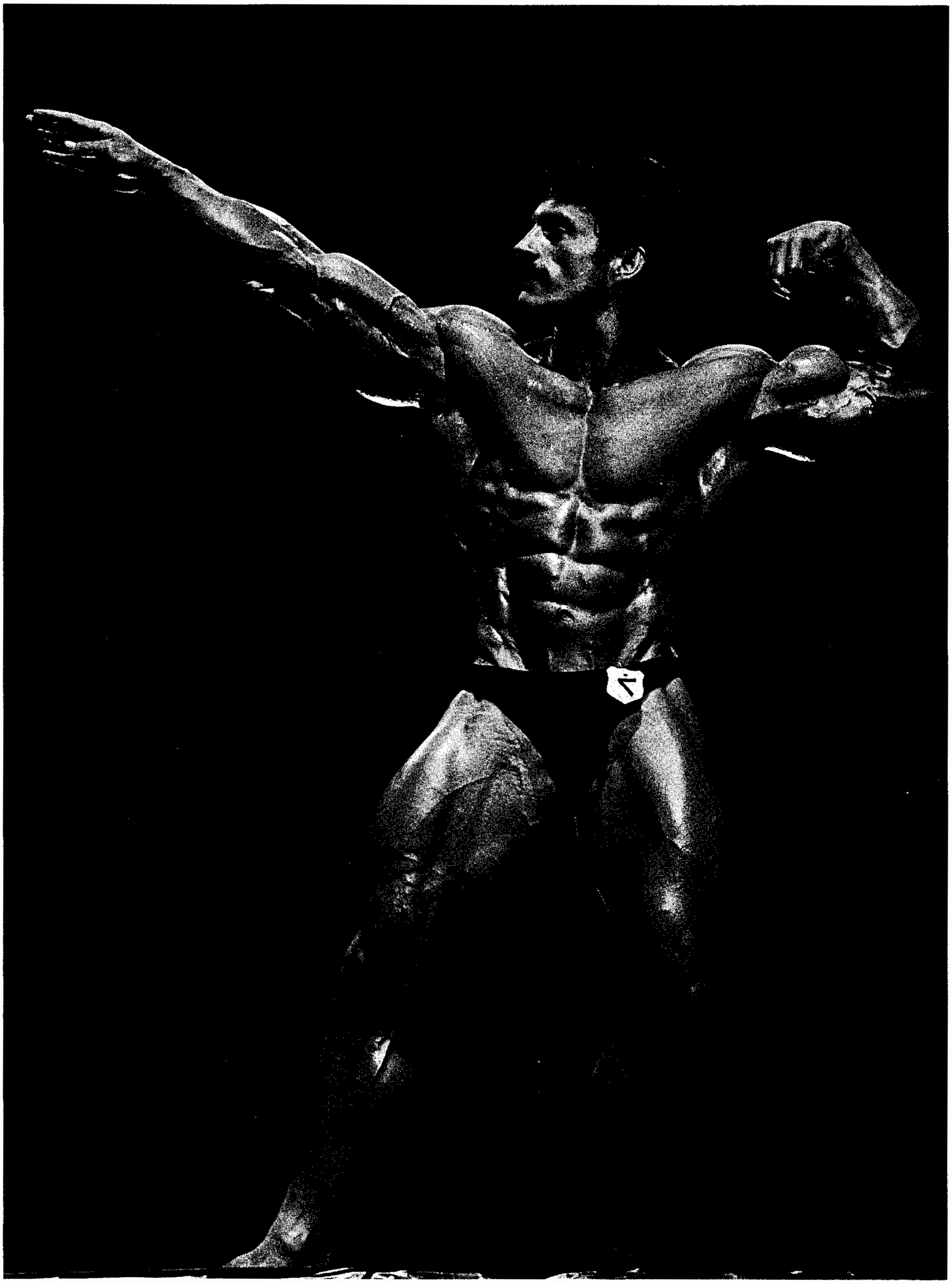
# HEAVY DUTY



## BY
## MIKE MENTZER



*Mike Mentzer in the absolute peak of condition at the 1980 Mr. Olympia contest.*

# HEAVY DUTY

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## MIKE MENTZER

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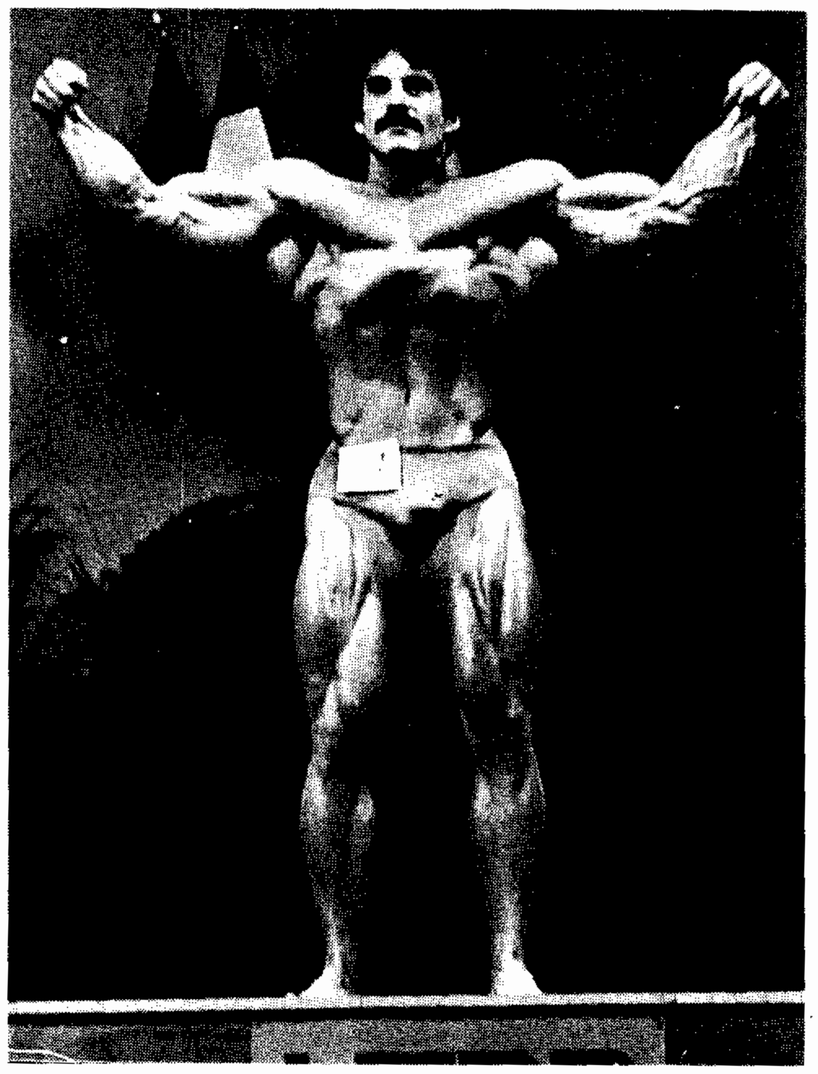


# Foreword

A little more than 15 years ago, a lone, solitary voice of reason was heard in the bodybuilding wilderness. It had to compete against the loud, confusing din of conflicting opinion, the echoes of tradition and convention and, not least of all, the booming exclamations of commercial interests. Still that voice was heard. Not always understood, to be sure, but it was heard nonetheless. This voice of reason belonged to a Pennsylvania native by the name of Michael John Mentzer, and it wasn't long before his words and influence spread like wildfire throughout the health and fitness industry.

The sport's established hierarchy did all they could to silence him. "After all," they declared, "we're all in this together. Let's help each other grow rich and the truth be damned. Bodybuilding can survive without Mike Mentzer." This proved to be true. Tragically so, in fact. In the 11 years that had passed since Mentzer had left the sport, foolish dietary indiscretions once again flourished alongside unproductive and, often, downright dangerous training methods.

Bodybuilders overtrained, reached premature plateaus and fell repeatedly short of the mark, without ever being able to learn the reasons why. The one voice that could have helped them had opted, like a latter-day John Galt, to remain silent.

Then, because truth is, after all, a fundamental requisite of survival, bodybuilders gradually began to raise their heads in an effort to locate it. They began to use their minds again. Slowly -- very slowly -- they started to deviate from conventional bodybuilding "wisdom" and started to actually think about their training methods. Inasmuch as they required reason to guide them on their quest, more and more of them sought out the words of Mike Mentzer. His name became synonymous with scientific precision and, more importantly, results.

*Supervising Dorian Yates on the Hammer Row Machine prior to the 1992 Mr. Olympia contest.*

Mentzer had not gone into hiding. It had only seemed like it to a rapidly growing bodybuilding public that was yearning for solid, factual training information to guide them in their quest for physical perfection. In fact, far from hiding, Mentzer was busy conducting private consultations, analyzing the cause-and-effect relationship of muscle growth among his rapidly burgeoning legion of clients, and continuing to inspire and influence untold thousands of bodybuilders and bodybuilding writers (myself included) in the process. In those "silent" 11 years, Mentzer had personally supervised the training of hundreds of aspiring bodybuilders, ranging from the poorly predisposed to such genetic marvels as Aaron Baker, Peter Paul and, lest we forget, a young English titan by the name of Dorian Yates, who would both seek out and apply Mentzer's Heavy Duty concepts so successfully that he would win the 1992 Mr. Olympia title!

Apart from merely supervising and monitoring workouts, Mentzer was also engaged in the one activity that some bodybuilders fear more than anything else on earth...critical thought. He analyzed and evaluated all training concepts and tested and retested his revolutionary theories about training intensity and recovery ability in the one practical lab where the results would be immediately apparent and not subject to debate -- the gym!

Further, both his thinking, theories and knowledge on the subject of productive exercise evolved and grew. So much so, in fact, that what was at one time dismissed as "Heavy Duty Theory" has now been firmly established by the scientific and medical community as "Heavy Duty Fact."

That Mentzer's Heavy Duty training methods are revolutionary is a given. No other bodybuilder in the history of our sport has been as prolific or as unsettling to established tradition as Mike Mentzer. Even his name conjures up images of bodybuilding's foremost iconoclast; the man who single-handedly convinced bodybuilders to train less frequently but more intensely, to eschew needless food supplements and focus instead upon a well-balanced diet with an emphasis on carbohydrates. He was, after all, a walking endorsement for his system of thought: he won the 1978 Mr. Universe contest with an unprecedented perfect score of 300!

Some will call Mike Mentzer bodybuilding's first true intellectual since, after all, he's a man who can back up whatever opinion he expresses with reams of scientific copy. To me, however, Mike is much more than that; he's a close friend, a devoted student of philosophy and, as he's proven on numerous occasions, he possesses that rarest of all character qualities -- integrity.

What you are about to read is not a "quickie" rehash of some previously written work, intended to dupe a gullible public into surrendering their hard-earned dollars. Instead, you're about to read the culminative fruits of a man's 20 plus years of thought and research into the exacting science of stimulating muscle growth. If you've read Mike Mentzer's works before, I can assure you that you'll appreciate all of the new concepts he's formulated along with those he's elaborated and modified over the years. If you're about to read Mike Mentzer for the first time, I envy you and, further, I guarantee your perspective of training will never again be the same.

One thing for certain, no matter who you are or what your current level of development may be, you're about to start growing again, both physically and (perhaps more importantly) mentally as well.

John Little,
Senior Writer, FLEX Magazine.

*Dorian Yates in the condition that made him an easy winner at the 1992 Mr. Olympia contest. (photo: Chris Lund)*

# 1

# Bodybuilders Are Confused!

Explaining the relationship between man's mind and art, Ayn Rand wrote, in an essay titled, *The Psycho–Epistemology of Art,* "While, in other areas of knowledge, men have outgrown the practice of seeking the guidance of mystic oracles, in the field of aesthetics this practice has remained in full force and is becoming more crudely obvious today."

To my knowledge, Miss Rand had no interest in bodybuilding, but if she had, she would have observed a similar phenomenon. The bodybuilders I communicate with on a daily basis are agonizingly confused. The sole source of information for many of them is muscle magazines, which they read with almost religious zeal, regarding the words contained therein as if they were the revealed truth of Sacred Scripture, or as oracular pronouncements, not to be questioned, but passively accepted, on blind faith.

Most bodybuilders fail to recognize that muscle magazines are not science journals, but rather commercial catalogues whose primary reason for existence is to sell nutritional supplements and exercise equipment. (One simply can't be too careful in this time of philosophical default. Even science journals have become suspect recently, as the proliferation of cases involving fraudulent research data at the highest levels indicates.) While these publications do contain factually-based, well-reasoned articles, these are rarities so at odds with the reams of contradictory misinformation that they are rendered valueless to those with atrophied critical faculties and often overlooked by the more intelligent readers.

The notion that bodybuilding is a science has been written and talked about for decades by muscle magazine writers and certain exercise physiologist. To qualify as a legitimate, applied science, however, bodybuilding must have a consistent, rational theoretical base,

something that none of the aforementioned -- aside from Arthur Jones and myself -- has ever provided. In fact, what passes today for the so-called "science of modern bodybuilding" is actually a pseudo-science. Propogated by the bodybuilding traditionalists, or orthodoxy, it is nothing more than a wanton assemblage of random, disconnected and contradictory ideas.

A number of the orthodoxy's self-styled "experts" have even alleged that there are no objective, universal principles of productive exercise. They claim that since each bodybuilder is unique, every individual bodybuilder requires a different training program. This implies that the issue of what is the best way to train to build muscle is a subjective one that can only be resolved by the random motions and blind urges of each bodybuilder.

Despite their belief that no universal principles exist, many of these same people advocate that all bodybuilders should perform 12-20 sets per bodypart, for up to two hours per session. For best gains, they recommend two and even three sessions per day six days a week, with the seventh day off -- for sabbath, I suppose. Very scientific!

The principle implicit in such thinking is "more is better." This is an ethico-economic principle: more money, more success, i.e., more values are better than less. (This principle does have a certain limited application to endurance training.) Taking a principle from one context, such as economics, and applying it uncritically and blindly to another, such as bodybuilding, is to commit the logical fallacy known as "context-switching." Some years ago, Mr. America Steve Michalik carried this erroneous notion to its logical conclusion by advocating 75-100 sets per bodypart! Michalik practiced what he preached and ended up almost literally in the grave!

So which is it: 12-20 sets or 75-100 sets? Actually, more fitting would be this line of questioning:

1) Why the contradiction? If each and every bodybuilder, being unique, requires a different training program, why advocate the same range of sets for everyone?

2) Why the equivocation? Whose word should we take -- and on what basis? Who is relating the truth: the advocates of 12-20 sets or the advocates of 75-100 sets? Or are they both unintentionally relating a falsehood?

3) Why the lack of exactitude? Will bodybuilders obtain equal results from 12 sets and 14 sets and 20 sets, or from 75 sets and 87 sets and 100 sets? Since science is an exact discipline, a proper science of bodybuilding should tell bodybuilders precisely what to do.

4) Why the evasion? Should all of the sets be performed with the same degree of intensity by the same individuals all of the time?

While the issues involved in the questions raised above represent only the tip of the iceberg, they do serve as telling testimony to some of the disastrous intellectual consequences that follow from lack of a sound, rational theoretical base.

A scientific theory is a set of principles that serves either as a correct description of reality or a guideline for man's actions. A farrago of unwarranted assumptions, false conclusions and irreconcilable contradictions does not constitute a valid theory and, thus, cannot serve as a guide to successful action.

(The orthodoxy commits other intellectual errors as well. A prime example is their

capricious misuse of concepts. Aside from an occasional arbitrary, out-of-context reference to the "overload principle," they have never adequately identified the specific stimulus responsible for inducing muscular growth. As a result, they feel justified in stealing the concept of intensity and providing it with a rubber meaning, though never using it properly. Another is the concept of overtraining. Unwilling or unable to define the term, only dimly aware that it means something negative, they use it as a "floating abstaction," i.e., a concept with no ties to reality. As such, it is not so much misused, but barely used at all, and plays no significant role in their thinking.)

Where can a confused bodybuilder find the answer to these and other pressing questions? Rick Wayne, erstwhile editor of *Flex* magazine, answered that question a number of years ago, claiming, "Each bodybuilder has to be his own scientific agent, and find the routine that works for him." But what if a particular bodybuilder isn't a very good scientist? No answer has ever been given.

Others have responded by suggesting that confused bodybuilders resort to instinct. An acquaintance of mine responded to this notion humorously by suggesting that if bodybuilders resorted to the "instinctive principle" to guide them in their training efforts, many of them would probably defecate and urinate on a barbell rather than lift it. Man is not an instinctual creature whose knowledge is automatic, or "hard-wired" into his nervous system, but a conceptual being who must acquire and use knowledge by a volitional cognitive effort.

The most philosophically revealing response was made by a well-known authority, and I quote, "There is a realm of truth higher than that known to scientists, and only certain people have access to it." Since reality is the realm of truth, one can only wonder as to what other realm he was referring to, what it might have to do with bodybuilding in this one, who has access to it, and by what means. All of this points to the fact that bodybuilding has brought about its own Dark Ages -- and why, therefore, so many bodybuilders become cynical and give up.

The advocates of the orthodox approach, possessing no possible theoretical defense of their argument, are forced to cite some very shabby evidence to back up their position. Quite frequently, I get the question, "If 12-20 sets is not the best way to train, how do you account for the success of guys like Arnold and Lee Haney?" The answer is that, while their physiques are, in part, the result of such training, so are the physiques of all the failures, whose numbers are legion.

Furthermore, it is a mistake to point to the "apparent" success of a couple dozen top title winners as indubitable proof that a certain training approach is efficacious. If one were to look back through the course of their bodybuilding careers, and calculate the hours, months and years of wasted effort resulting from their blind, non-theoretical, volume approach, one would have to question whether their achievement could properly be termed success at all.

It should be understood also that genetic endowment is the prime determinant of bodybuilding success. Arnold and Lee, not to mention myself, Dorian Yates and all who have achieved extraordinary levels of muscular development, possess an abundance of the requisite genetic traits, including long muscle bellies, greater than average muscle fiber density, and

superior recovery ability.

The best way, therefore, to compare the efficacy of the two training approaches is to examine the results obtained by a genetically superior practitioner from each camp. On May 1, 1973, Casey Viator entered into an experiment -- conducted at Colorado State University in Fort Collins -- for the purpose of discovering how much muscle he would gain on a high-intensity training program in one month.

Casey trained only three times a week, with each workout lasting no more than 30 minutes. Since the duration of the experiment was a month, this meant that Casey trained 12 times, for a total of only six hours. The result was that Casey went from a starting bodyweight of 166 pounds to his previous highest bodyweight, in top muscular condition, of 212 pounds. The exercise physiologist who conducted the experiment, Dr. Eliot Plese, discovered (using a sophisticated radioisotope assay machine) that Casey lost 17 pounds of fat during that month. Casey's actual lean body-mass gain, therefore, was not merely the 46 pounds as evidenced on the scale, but a whopping 63 pounds -- and all from only six hours of training!

Now contrast Casey's achievement with what Arnold Schwarzenegger did to prepare for the 1975 Mr. Olympia contest. Arnold has gone to considerable lengths advertising the fact that, starting in July of that year, he trained twice a day for two hours each session, or four hours a day, six days a week, right up to the contest date in November. As a result of training that totalled 288 hours, Arnold put on approximately 25 pounds of lean mass, going from his starting weight of 200 pounds to 225. It is interesting to note that Arnold, in gaining back only 25 pounds of muscle, failed, in that four-month period, to reach his previous best muscular bodyweight of 237 pounds.

Not only are Casey and Arnold genetically gifted, both were also regaining muscle mass, which happens more readily than gaining it in the first place. And since both were taking steroids during these periods of training, one is left to conclude that the factor accounting for Casey's vastly superior achievement was his use of high-intensity training principles. (When I asked Arnold, in 1979, why he had failed to attain the same 237 pounds for the 1975 Mr. Olympia that he competed at in the 1974 Mr. Olympia, he responded by saying that the four months he had to prepare wasn't enough time.)

To those who question the validity of the abbreviated high-intensity training approach, by noting the numerical superiority of those utilizing the "more is better" volume approach, I need only point out that statistical generalizations do not constitute valid proof in matters open to individual choice. A good historical example is that for thousands of years millions of people sincerely believed that the earth was flat, but that didn't make it so.

A mistake made by many muscle magazine readers is to assume that the routines currently ascribed to the top champs are of the same variety they've always used. In most cases, the champs started their bodybuilding careers, and developed the bulk of their muscle mass, with abbreviated routines performed two to three times a week, using basic exercises and heavy weights. As they progressed into the competitive ranks, they made the mistake -- as I did for a while -- of increasing the number of sets along with the number of workouts per week, which explains why many stagnate and even retrogress. Increasing the duration and frequency

of their workouts was done in conjunction with the use of steroids, which help to prevent, or at least reduce, the loss of muscle mass that otherwise results from chronic marathon training.

Considering the fact that the self-proclaimed experts have neither provided a consistent, rational theory of training, nor addressed the issues raised here, it is little wonder that so many cynical bodybuilders remain painfully bewildered.

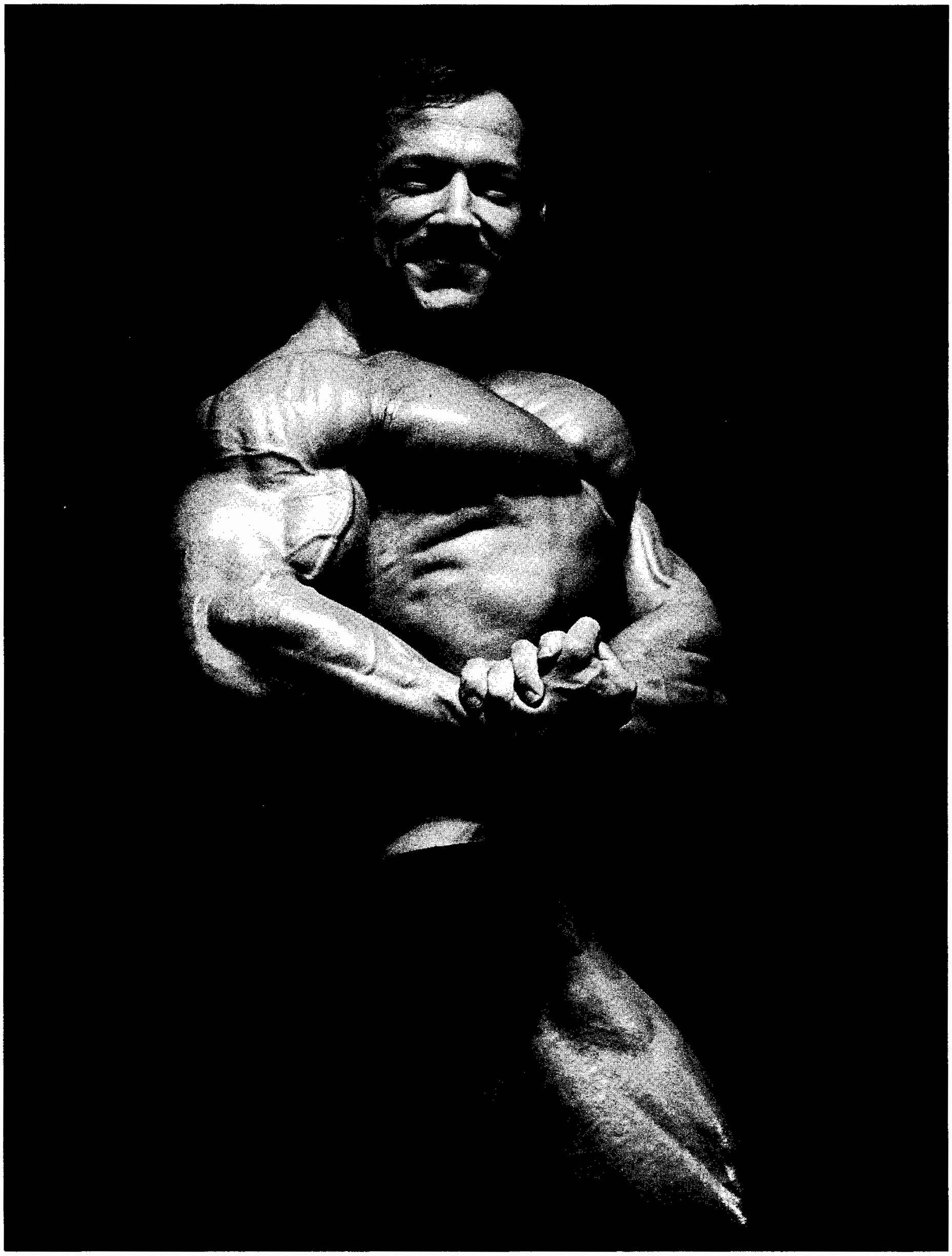
About 20 years ago I found myself in a situation similar to that experienced by many of the aspiring bodybuilders I now communicate with on a daily basis. I avidly read all the muscle magazines, and had memorized the training routines, dietary regimens, and even the personal habits of all the top champs. Following their lead, I utilized the "more is better" principle, performing up to 30 sets per bodypart, training three hours a day, six days a week. After months of training in this fashion with no progress, my motivation waned so much I began thinking seriously about ceasing my training efforts altogether. I reasoned that if training three hours a day wasn't sufficient to cause an increase in my muscle mass, then perhaps I would have to up my training to four hours a day. And it was difficult to justify spending even more time in the gym every day, as I was already tired from my 12-hour work days in the Air Force and the three-hour daily workouts. If developing a championship physique meant giving up all social life and spending one-fourth of my waking hours in some dank gymnasium, it just wasn't worth it.

Agonizing over the prospect of forsaking my dream of ever being a champion bodybuilder, I was fortunate, at that time, to meet Casey Viator at the 1971 Mr. America contest in York, Penn. Not only was Casey the youngest man, at 19 years of age, to win the coveted title, he was also being favorably compared to Arnold (who was in York that day to check out the upstart). What made Casey even more interesting was the type of training he was doing. While Arnold, Franco, Dave Draper et al were training up to five hours a day, Casey was training less than three hours a week!

Casey was impressed by my physical potential, and suggested that I call his mentor, Arthur Jones, the inventor of Nautilus machines. I placed a telephone call to Jones early one evening, but, as he wasn't in, I left a message that I had called. He called me back at *2 a.m.* the next morning, something, I learned later, that was typical of the radically independent businessman. Before I could suggest that it might be more appropriate that we speak later that day when I had my wits about me, Jones launched into an impassioned disquisition concerning the actual nature of productive exercise, as opposed to that which was being promulgated in the muscle magazines.

So awe-inspiring was his fiery oratory that the leaden fumes of my somnambulistic stupor evaporated in short order. For well over an hour, I listened in rapt attention as Jones explained to me, in the most scrupulously objective language imaginable, the cause-and-effect relationship between intense exercise and muscular growth; and why, in light of the fact that the body's ability to tolerate such demanding exercise is limited, high-intensity training had to be brief and infrequent.

Before Jones finished, I realized that I was not the bodybuilding expert I had thought. In fact, I knew very little of value about exercise. Memorizing training routines from muscle



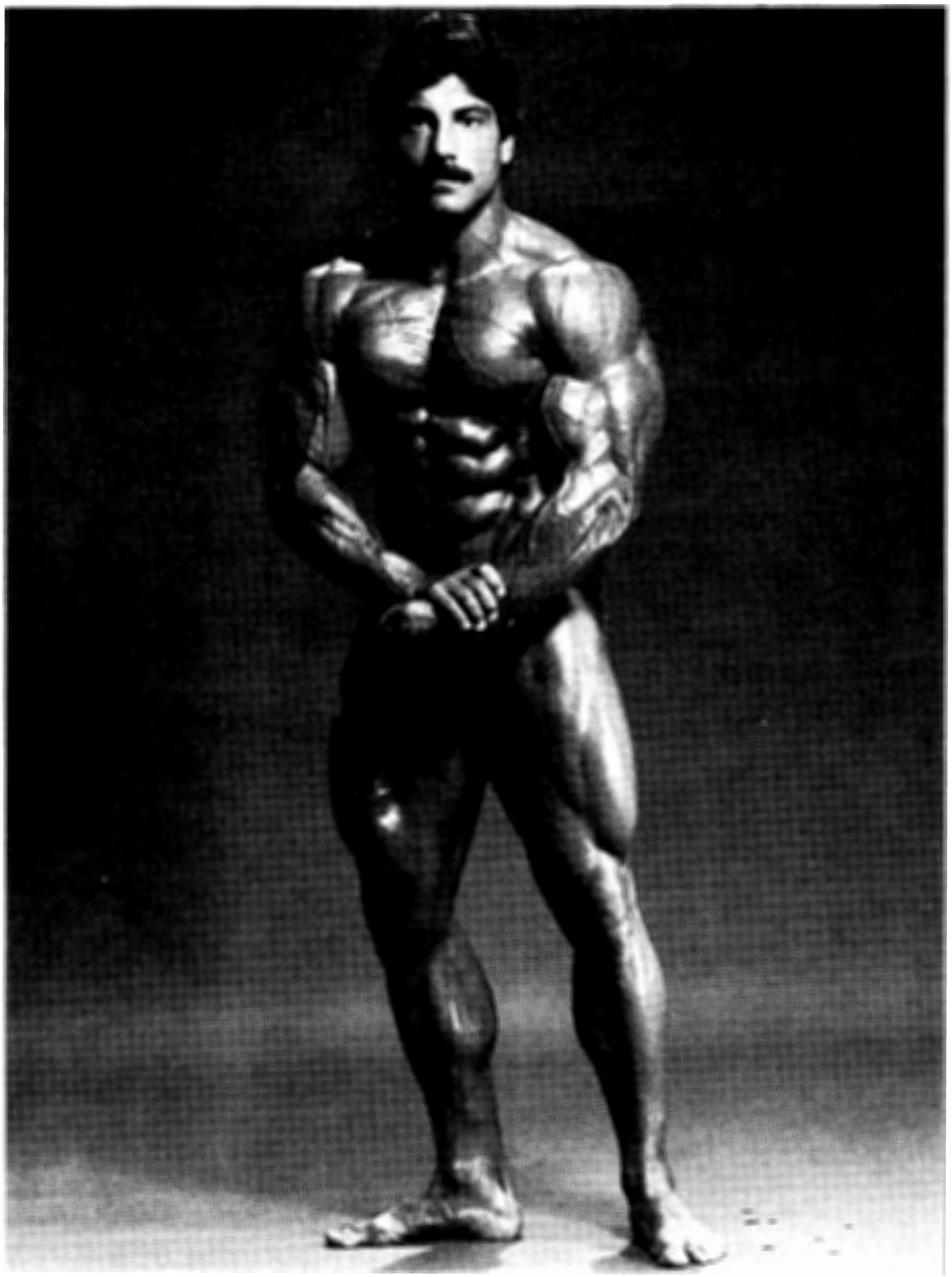
*Casey Viator, one of the greatest bodybuilders ever and the man who introduced Mike Mentzer to Arthur Jones.*

magazines doesn't make one an expert. For the first time in my life, I had listened to someone who took the values of knowledge, reason, logic and science very, very seriously. Having clearly understood what Jones had to say about exercise that early morning over 20 years ago, I promptly switched to a high-intensity training program, and within only a year and a half, my mediocre physique underwent such a dramatic transformation that I was able to easily win the Mr. America contest.

Many bodybuilders sell themselves short. Erroneously attributing their lack of satisfactory progress to a poverty of the requisite genetic traits, instead of to their irrational training and dietary practices, they give up training. Don't make the same mistake. Don't make the mistake of granting validity to all training theories, and then waste precious time frantically trying one after the other in the hope that someday you'll find something that works.

There is no good reason why you should proceed with your bodybuilding career confused and uncertain any longer. Progress should not be an irregular, unpredictable or even nonexistent phenomenon. A rational approach to bodybuilding, one based on an understanding and implementation of the scientific principles of exercise and nutrition, will put you on a more satisfying path of regular progress.

*Arthur Jones, the inventor of the Nautilus Machines, taught Mike Mentzer the theory of productive bodybuilding exercise.*



*Ray Mentzer backstage the night he won the '79 Mr. America contest.*

# 2

# A Rational Approach

The enormous passion -- and single-track devotion -- exhibited by those seeking to develop stronger, more muscular bodies is often their most salient characteristic. Passion by itself, however, is just that -- an intense desire to achieve a value-goal. Alone, it is nothing more than blind emotion, which will serve only to mire the individual in a gray fog of helpless confusion.

The basis of a rational approach to bodybuilding -- or any other arena of endeavor -- is the recognition that only the appropriate, specific knowledge can lead one to engage in the purposeful action required to successfully achieve a goal. The reason that NASA has been so spectacularly successful with their space missions stems from their thorough understanding of the scientific principles involved with space travel. They don't merely "kinda" or "sorta" know what they're doing. They know, down to the smallest detail, precisely what is required. And when they make a mistake, as has happened, they understand that they retain the frame of reference (reality) and the means (reason) necessary to correct it.

A rational bodybuilder understands that, once he has established a goal, it is crucial he successfully achieves it -- as the implications to his self-esteem, confidence and happiness are profound. Not only does he want to avoid failure, but being conscientious, he also earnestly seeks the most productive, or time-saving, method to achieve his goal.

Many start bodybuilding with more than just a desire to develop a more muscular physique. Actuated by the sense that their lives are important, and that great achievements are possible, they aspire to win major physique titles. Since what can ultimately be achieved is, in large part, dictated by the individual's genetic programming, no one can know from the outset of his bodybuilding career how much muscle mass he will develop. One thing that you have

in common with Dorian Yates, Lee Labrada and me is that we all started out dissatisfied with our appearance and decided to do something about it.

Since none of us have the luxury of knowing from the start just how much muscle we can ultimately develop (as potential can be assessed accurately only in retrospect), such a consideration has no relevance in formulating a bodybuilding program.

What is relevant is the fact that anyone, no matter what his genetic endowment, can improve upon his existing physical condition. And with the proper training program, he should witness progress *each and every workout*, from the start of his training until he reaches the upper limit allowed by his genetic potential. (Bodybuilders using the traditional volume approach possess such diminished expectations that they are literally incredulous on this last point.)

I never cease to be amazed by the Sisyphean efforts of bodybuilders who are willing to train for months -- and even years -- while experiencing little or no progress. Not knowing the proper standard by which to evaluate the success of their workout-to-workout efforts, they aren't certain how to direct their training, and then waste time frantically trying arbitrary, nonproductive routines selected at random from the muscle magazines.

In most cases, bodybuilders unwittingly combine moderately intense bodybuilding/strength training (using weight resistance exercise) with endurance training (using the "more is better" principle); and because the body has a limited adaptive capacity, they obtain mixed results, i.e., a little bit of strength and size along with some endurance. The ultimate result is they waste years developing a physique that they should have been able -- had they trained properly -- to acquire in a fraction of the time, or, as is all too frequently the case, they cease their training efforts entirely due to frustration and failure.

There is a principle in exercise physiology referred to as SAID, or specific adaptation to imposed demands, which means that the body adapts in a specific fashion to specific demands. If your specific goal is to improve upon your ability to carry out large volumes of work, then you must train in a specific fashion, i.e., with low to moderate intensity, employing a large volume of sets. If, on the other hand, your specific goal is to increase your muscular size and strength, then you must also train in a specific manner, i.e., with high intensity and a low volume of sets. It's not as if the body has 100 units of resources available for adaptation in the form of size/strength, and another 100 units available for adapting with increased endurance. Training guided by mixed premises will not yield results of the same magnitude as adaptive-specific training.

What bodybuilders should be training to develop specifically is their strength. That's right! A properly conducted bodybuilding program is directed exclusively toward the development of strength. Why? Because muscular size and strength are related. It was discovered by scientists a long time ago that the strength of a muscle is directly proportional to its cross-sectional area. This, along with the fact that the body's adaptive capacity is strictly limited, dictates that an efficient, productive bodybuilding program be geared exclusively and specifically toward the development of strength. So if you desire mixed or no results, combine strength training with endurance training. But if your goal is to develop your muscles to the largest possible degree in the shortest possible time, then... TRAIN

*Ray and Mike Mentzer, the only brothers to win the Mr. America title.*

SPECIFICALLY FOR STRENGTH!

Upon hearing this, many bodybuilders lodge a protest in the form of an argument that usually goes something like this: "How can strength and size be related when I know guys with less muscle who can lift heavier weights than others who are more massively developed?" The mistake here is in attempting to draw a meaningful comparison between two different individuals. The fact is that the guy with less muscle will grow larger muscles only as he grows stronger, and likewise, the more massive guy will be even larger only when he is stronger. The "apparently" greater strength of the less heavily muscled individual can be accounted for by the presence of mitigating factors such as favorable tendon attachments and superior neuromuscular efficiency. The muscles of the more heavily developed individual, while capable of contracting with greater force, have less demonstrable strength owing to the presence of such disadvantages as longer bones and the fact that, as muscles grow progressively larger, their "angle of pull" becomes less efficient.

Don't make the mistake of comparing yourself to others. The only person you can accurately compare yourself to is . . . YOU! You will be bigger only when you are stronger, and so long as you are getting stronger as a result of each workout, your training is headed in the right direction.

As stated above, bodybuilders who don't understand that they should be training for strength, don't know how to direct their efforts. Those who don't know how to direct their efforts often waste precious months and years, during which time they witness little or no progress. It's as if they are waiting for a *zap!* out of the mystical realm of whims and wishes to one day deliver them their much dreamed of muscles.

If you are such an individual, wake up -- and stop wasting your time. Presumably, your life and goals -- for you at least -- are of greater value-significance than any NASA space mission. There is no good reason -- now that you have the knowledge -- why you shouldn't soon be well on your way to achieving your goal of a more muscular physique. There is no mystery to any of this. The knowledge of the specific cause-and-effect relationship between intense exercise and muscular growth does exist. When you are training properly, i.e., intensely, briefly and infrequently (more on this in chapters 3 and 4), you will be witnessing progress in the form of strength increases every workout.

A question I get asked frequently is "Mike, if I try Heavy Duty, will I see results in six months?" And my reply is "You won't have to wait six months, you'll see results immediately -- from the first workout." Progress should be immediate and significant, from the time you start using a routine; and it should be continuous from then on. Arthur Jones made a statement years ago to the effect that from the time a bodybuilder starts training, he should be able -- if he is using the proper program, of course -- to develop to the maximum degree allowed by his potential within two years. It should not take five years, or longer, to develop a muscular physique.

While you should come to expect strength increases regularly, not everyone should expect a regular, attendant increase in mass or bodyweight. For the majority, strength increases precede size increases. In other words, you will get stronger for a while without getter bigger.

I don't want to mislead anyone on this point. It is important that you understand this for reasons related to motivation. As you continue to grow stronger, however, your strength increases will eventually yield a muscle mass increase. Just how much muscle you gain, and how long it takes, is a matter dictated by genetics.

I was just such an individual who gained weight and mass cyclically. I can remember numerous stretches during which my strength increased regularly, for up to a few months, without an accompanying size increase. Not knowing that for many, strength increases precede size increases, this was very frustrating to me. In fact, I was tempted to give up entirely more than once, but I persisted, and my burgeoning strength always finally yielded an appreciable mass increase. I have observed this same pattern with many of my personal training clients. They will gain regularly in strength for months, with little or no mass increase, and then -- boom! -- within a short period, they'll find themselves four, five or six pounds heavier.

On the other hand, some bodybuilders experience consistent, proportional strength and mass increases. An outstanding example of this was one of my personal training clients. During a four-month period, his strength increased (he went up either in reps, weight or both) on every set of every exercise, for a total of almost 400 sets. In that time, he put on 35 pounds of bodyweight, most, if not all, in the form of lean muscle mass, as evidenced by his improved definition. This individual was all but ecstatic, as he gained more muscle in that four-month period, with his three weekly workouts averaging 17 minutes, than he had gained in the preceding four years, working out two hours a day, six days a week. (At the time I started working with this individual, he was considering giving up training entirely because he thought he didn't have the genetics to build any more muscle!)

David Paul, of the famous Barbarian Brothers, approached me a while back, disgruntled by the fact that he had gained neither in size nor strength for the last five years, during which time he trained up to four hours a day, six days a week. For the one month that I supervised David's training, each of his three weekly workouts lasted less than 30 minutes, and he upped his squat poundage by 185 pounds while gaining five pounds of muscular bodyweight!

Aaron Baker, Mr. USA, is another good example. Not certain as how to direct his own training efforts for the 1991 WBF Championship, Aaron met someone who talked him into using a much touted Eastern European training system that had him training three hours every day. As a result, Aaron's bodyweight dropped from a very hard, muscular 235 pounds to a soft 205, and he ended up placing a very disheartening last. Not long after the contest, I had a talk with Aaron about the shortcomings of the Eastern European system. I also explained to him why, with a properly conducted high-intensity program, he would experience progress continuously. He decided to give it a try, and within several months, his squat increased 300 pounds, his machine incline press jumped from 400 pounds to 670 pounds, and his bodyweight reached an all-time high of 254 pounds! As a result of such progress, and his third-place finish at the 1992 WBF Championship, Aaron is now a zealous advocate of high-intensity training.

*Aaron Baker, Mr. USA. (photo: Art Zeller)*

* * *

Many bodybuilders evaluate the success of their efforts by the wrong standard -- by whether or not they are gaining bodyweight on a regular, even daily basis. This is a mistake, as muscle mass increases, even at best, are negligible on a daily, or even weekly, basis. An increase of 30 pounds of muscle in a year -- more than the average bodybuilder can expect to gain -- would average out to slightly more than an ounce a day, certainly not enough to register daily or weekly on the standard bodyweight scale.

A 10–20 pound increase in muscle mass in one year is more realistic for most. (And, because the vast majority gain weight erratically, one should not necessarily expect regular, or predictable, bodyweight increases.) This may not sound impressive to many, but if a bodybuilder were to sustain a growth rate of 20 pounds per year for two years, he would, of course -- considering he didn't lose any bodyfat -- end up 40 pounds heavier! Visualize 40 pounds of beefsteak laid out in front of you on the dinner table, and you will get some idea just how much muscle that is: enough to transform the average adult male, weighing 165 pounds, into a veritable Hercules at 205 pounds.

Realistic expectations figure centrally in formulating a nutritional regimen. Once you understand that growth is negligible on a daily basis, even in a best case scenario, you'll be less likely to commit grossly irrational dietary mistakes. Those who expect to gain weight on a very regular basis are gullible prey to the nutritional supplement hucksters, and usually end up with no more muscle, less hard-earned money, a lot of fat, and even more confusion!

Let's assume hypothetically, for the sake of this discussion, that you have the required genetics, and will train properly in the course of the next year, so you gain 10 pounds of muscle mass. That averages out to approximately 12 grams of muscle per day, or less than one-half of an ounce.

Precisely how much food you would require to provide the nutritional elements needed for that much growth is actually quite simple to calculate. Since one pound of muscle tissue yields about 600 calories, and you are going to gain 10 pounds of muscle, you'd have to consume 600 times 10, or 6,000 calories a year, above your maintenance level. That's right! -- 6,000 extra calories a year. Not a day, a week or a month, as many of the hucksters would have you believe, but 6,000 extra calories a year!

Formulating a daily dietary regimen is difficult to do based on yearly caloric considerations. To find out how many calories you'd need each day beyond maintenance, divide 6,000 by 365 (the number of days in a year), and you come up with about 16 extra calories a day. That certainly isn't much, perhaps two bites out of an apple.

Most bodybuilders make the mistake of force-feeding themselves hundreds of extra grams of protein and thousands of extra calories a day beyond maintenance needs -- in the mistaken belief that so doing will hasten the muscle growth process. The body has specific nutritional needs each day. The operative concept here is ***needs***. The word "need," in this context, implies a limit that cannot be transcended. Consuming more food than you need for maintenance, and that little bit of growth you may be stimulating workout to workout, only results in the deposition of fat.

Contrary to what the hucksters would like you to believe, muscle is not comprised mostly of protein. Muscle, in fact, is comprised of up to 72% water in healthy individuals, with only 22% being protein, and the remainder being inorganic materials and lipids. If the hucksters were true to their one cherished guiding principle, namely, more is better, they would have you drinking gallons of extra water a day. Water consumed beyond need is merely excreted. That same luxury does not exist with the overconsumption of protein and carbohydrates, because they contain calories. Calories consumed beyond what is needed for maintenance and growth -- no matter what the source -- turn to fat.

Most bodybuilders are already overnourished -- as evidenced by a level of bodyfat inconsistent with a defined appearance -- and still don't make satisfactory progress. This points clearly to the fact that their problem is not related to nutrition, but lack of sufficient growth stimulation.

A common misconception is that bodybuilding is 80% nutrition and only 20% training. The implication is that it doesn't matter how you train, or even that you train at all, but if you merely consume an excess of nutrients, you'll grow anyway. Another, more recent, misconception is that there is no such thing as overtraining, only undereating. The implication here is that if you will only agree to overeat, you can then infinitely extend the limit to which you can stimulate the body to grow. This is not true. Because the supply of biochemical resources used up in the process of growth stimulation is strictly limited, and cannot be restored instantaneously, no matter how much you eat, the amount of training you can engage in -- before it becomes overtraining -- is also strictly limited. All such notions are always presented out of context, with neither a theory nor even a jot of evidence to back them up. In logic, these are referred to as baseless, arbitrary assertions, and they are perpetuated by individuals seeking to hawk nutritional products to the unenlightened.

Nutrition, as it applies to bodybuilding, is actually quite simple. The single most important principle is that a reasonable effort be made to consume a well-balanced diet, which, by definition, is one that provides the individual with the required daily dietary allowances of all the nutrients to maintain health as well as provide for any possible muscular growth. And make no mistake about it, training is the most important factor, while nutrition is only a secondary consideration. Growth must first be stimulated through proper, high-intensity training, then enough nutrients must be consumed to maintain existing physical mass, along with a little extra to provide for that negligible bit of growth that is being stimulated workout to workout.

It was determined by the U.S. Department of Agriculture (presumably an objective, unbiased group with no vested interest in distorting nutritional reality for the sake of selling nutritional supplements) that a well-balanced diet could be obtained by an individual consuming the recommended daily portions from the Four Basic Food Groups: 1) Cereals and grains, 2) Fruits and vegetables, 3) Meat, fish and poultry, and 4) Milk and dairy products.

Nutritional supplements were devised decades ago by medical researchers to be used, as the concept denotes, as "supplementation" to correct existing deficiencies for medical reasons. They were never intended as core elements in the diet for healthy people consuming

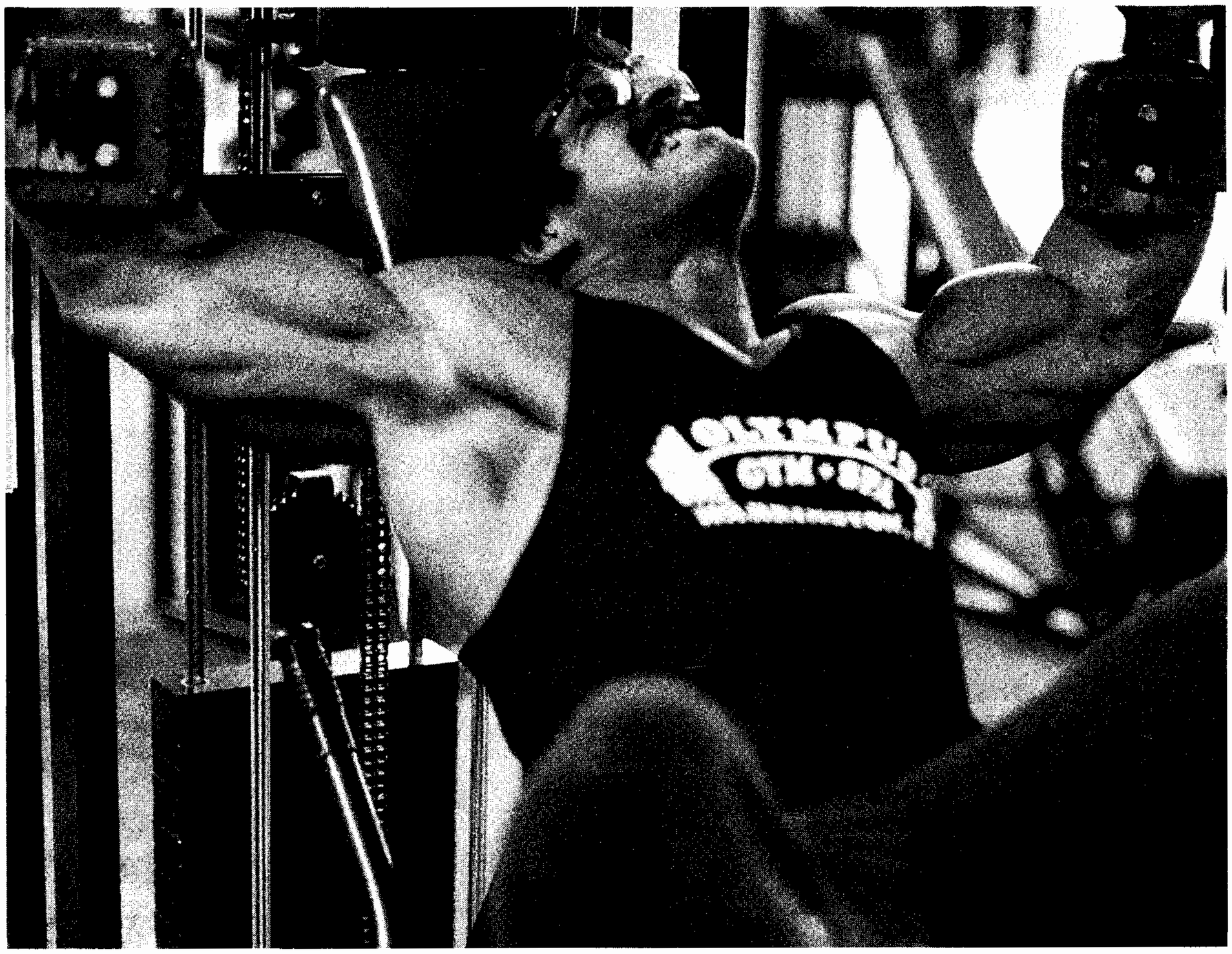
well-balanced diets.

Considering the scale of valid, scientific training and nutritional knowledge that does exist, it's curious that so relatively few avail themselves of it. One would think that even those who are skeptical that one hour of strength training a week is sufficient to ensure optimal progress, or that a well-balanced diet is all that is required nutritionally, might at the very least consider the possibility. For those immune to the blandishments of rational theory, there is ample evidence -- the success of myself, my brother Ray Mentzer, Casey Viator and Dorian Yates (among others) -- that the Heavy Duty approach does produce worthwhile results. Even if high-intensity training yielded only the same results as the traditional marathon, six-day-a-week training, it still wouldn't be valid to say that they were equally productive. The one that involved less actual training time would be the most productive.

Considering what you know now, ask yourself: Have I been reaping from each of my workouts what I should? Can I continue to justify spending 12-24 hours a week in the gym for very little or no progress? And what if I could gain considerably more by spending much less time training?

In one of his Nautilus Training Bulletins, Arthur Jones wrote, "It is only rational to use that which exists in limited supply as economically as possible." Although he was referring to recovery ability, it is also true that time, the medium we invest in achieving our values and goals, exists in limited quantity. A rational individual will not want to spend any more time in the gym than is minimally required to achieve the desired result. This leaves more time to pursue other rational values -- such as knowledge, money and relationships -- which make for a fuller, more rewarding life.

*Dorian Yates, weighing a rock-hard 265 pounds, one month prior to the 1992 Mr. Olympia.*



*Mike Mentzer on the Nautilus Flye Machine.*

# 3

# The Science of Bodybuilding

When one considers that the dominant intellectual approach of the growing number of self-styled "experts" in the bodybuilding field is characterized by approximation, contradiction, equivocation and evasion, it is little wonder that an entire generation of bodybuilders (many of the top champs included) finds itself bewildered and without rational guidance. However, let me assure those who refuse to allow the flame of their passion for a more muscular body to die, who, having some awareness of the role of facts, logic and reason in their lives: there does exist a science of bodybuilding -- and it can be understood by anyone willing to exercise the required effort.

All science represents the attempt to methodically identify the facts of reality and to understand the principles underlying its organization and behavior. The science of bodybuilding begins where any science begins: with the recognition that reality is an objective absolute, not an indeterminate, whirling flux. The fact that reality and its laws (the laws of physics) are immutable is what makes it possible for NASA to send men to the moon and bring them back safely. Similarly, the fact that the principles of anatomy and physiology are universal, and not subject to arbitrary change, is what makes it possible for medical science to exist as a viable discipline. In other words, if every individual's cells, organs and muscles were constituted and functioned differently, doctors couldn't make diagnoses, perform surgeries,

or dispense medicines. It should be obvious, therefore, that since the universe is an absolute of clear-cut identity, guided by one never-changing set of principles, there can be only one valid science of anything, including physics, astronomy, medicine -- and bodybuilding.

The bodybuilding traditionalists claim that no objective, universal principles of exercise exist. They imply that the issue of how to best train to develop larger muscles is arbitrary and subjective, not rational and scientific, and then they contradict themselves by exhorting all bodybuilders to train in the same manner.

While it's true that each of us is different in the sense that every individual possesses the stamp of an unrepeatable, irreplaceable personality, we are all essentially the same anatomically and physiologically. It follows, logically, that the biochemical changes resulting in muscular growth are the same in all individuals. Furthermore, the specific stimulus required to induce those biochemical changes would be the same for each member of the species.

# The Intensity Factor

It has been widely observed that men who engage in highly repetitive tasks, such as common laborers, distance runners, and swimmers, show little improvement in their muscular size or strength as a result of their efforts. Such tasks, being of low intensity by nature, do little to stimulate such an adaptive response.

Over a century ago it was discovered -- and it has been verified and re-verified since then -- that the specific stimulus responsible for inducing muscular growth beyond normal levels in human beings is related to intensity of effort. The closer the percentage of effort gets to 100%, the greater the growth stimulation. High-intensity muscular contractions, therefore, are an absolute requirement for stimulating rapid, large-scale increases in muscular size and strength. Because of the brutally demanding nature of such training, it's impossible to perform a large number of high-intensity contractions in any given workout. This means that either you train hard, or you train long, but you cannot train hard *and* long.

Properly defined, intensity refers to the percentage of possible momentary muscular effort being exerted. It is only on the last rep of a set carried to a point of momentary muscular failure that an individual is forced to exert 100% of his momentary ability.

Executing that last, almost impossible rep causes the body to dip into its reserve ability. Since it has only a small amount of this reserve to draw upon before depletion occurs, the body protects itself from future assaults on its reserves by enlarging upon its existing ability through the compensatory buildup of more muscle mass.

Only high-intensity training can force the body to resort to its reserve ability sufficiently to stimulate an adaptive response. Repeating tasks that are well within your existing capacity will do nothing to spur growth. Ending a set before failure, just because an arbitrarily chosen number of reps has been completed, will not cause you to grow.

While a healthy, well-conditioned individual is capable of engaging in an all-out effort at practically any time, such effort is required only on the last rep of a set carried to a point of failure. If an individual is capable of curling 100 pounds for a maximum of 10 reps,

the intensity of the first rep will obviously be low, since he has to exert only a small percentage of his possible momentary ability. As he fatigues with each succeeding rep, the situation improves, since he will be required to exert an increasingly greater percentage of his momentary ability. The 10th or last possible rep will be of the highest intensity since an all-out effort, involving 100% of his momentary ability, will be necessary.

Carrying a set to the point where you are forced to utilize 100% of your momentary muscular ability is the single most important factor in increasing size and strength. Working to a point of momentary muscular failure, where another rep is impossible despite your greatest effort, ensures that you pass through the "break-over point," or that point in the set below which growth will not be stimulated, and above which growth will be stimulated. (Even those who doubt the validity of the theory of high-intensity training are forced to admit that the last rep of a set carried to failure would be the most productive one of the set; thus, without realizing it, they have embraced its first principle.)

Many have raised the question whether it is actually necessary to train to failure, where 100% intensity of effort is required to complete a rep, in order to stimulate an increase. For instance, maybe only 67%, 85% or 92% intensity of effort is all that is required. The problem here would be in measuring intensity. The fact that there are only two accurate measures of intensity -- 0%, when you are at complete rest, and 100%, when you are exerting yourself maximally -- makes it necessary that you train to failure. So long as you are exerting yourself 100%, you have passed through every possible "break-over" point.

Brief, high-intensity training stimulates the body in a way that no amount of lesser intensity training even closely approximates. To make this more fully clear, Arthur Jones once compared the cause-and-effect relationship between intense exercise and muscular growth to striking a stick of dynamite with a hammer to cause an explosion. Only one hard, well-placed blow from the hammer is required to stimulate an explosion, and no number of lesser blows will do the trick. Likewise, only one set of high-intensity exercise is required to stimulate growth in a muscle, with no amount of lower intensity exercise having the same effect.

# The Economics of Growth and Recovery

The principle of intensity is the cornerstone of the scientific theory of productive bodybuilding exercise. Once you have grasped the fact that high-intensity effort is the factor responsible for stimulating growth, the issue that logically arises is: How many such high-intensity sets should one perform for optimal results?

I will preface my answer by stating that optimal results can only be achieved if the least number of sets required is performed. Overtraining, by definition, means performing any more exercise than the precise amount required for optimal results. Exercising beyond that point is not merely wasted effort, it is counterproductive; it is that which militates against your realizing optimum progress. And while performing even one set more than minimally required to stimulate an increase will hamper growth, the net negative effect of each additional set increases geometrically.

Up to a very definite point, imposing a high-intensity training stress on your body will stimulate an adaptive response. Performing more exercise than the least amount required will make unnecessary inroads into the body's recovery ability, or limited reserve of resources, and hamper the process of growth production. Carried to extremes -- as with the marathon, six-day-a-week type of training -- the body's recuperative system will no longer be able to compensate for the merely exhaustive effects of the exercise, and decompensation (loss of strength and mass) will occur.

At this juncture, it is important to note the distinction between growth stimulation and growth production. High-intensity training serves only to stimulate growth, which means it acts as a trigger that sets in motion a series of physiological steps which will, in time, culminate in the actual production of growth -- but only if certain preconditions are met.

The first thing the body must do following a workout is recover, i.e., replenish the biochemical resources used up as a result of the workout. Once this is accomplished, the body can then devote itself to the production of growth. And if the resources that were used up as a result of physical activity were not continuously being restored, debilitation and eventually death would result. Recovery, therefore, precedes growth.

Recovery and growth are distinct physiological processes, both requiring time to be completed. When training is carried on too long, or not enough time elapses between workouts to allow for full recovery, the growth process will be short-circuited.

The amount of training -- whether it be of long or short duration -- is always a negative factor insofar as recovery ability will be disturbed to some degree. The less the inroad into recovery ability, the more the body's resources can be utilized for growth. Marathon training, of the aforementioned 12-20 set, six-day-a-week variety, is not only of too low an intensity to stimulate much in the way of meaningful growth, it depletes so much of the body's resources and allows so little time for recovery that it prevents the production of any growth it might stimulate.

One of the major reasons bodybuilders overtrain is their failure to recognize that not all types of exercise exact the same toll on the body. High-intensity bodybuilding is not aerobics! The magnitude of the demand on the body's limited recovery ability made by high-intensity training is literally enormous, which explains why one must be careful not to perform any more sets than actually required to stimulate growth.

Imagine a straight horizontal line, drawn across a piece of paper from left to right, representing zero effort. If you were to graph your daily efforts -- getting out of bed, driving to work, performing light aerobic exercise, etc. -- off of that same flat line, again going from left to right, it would be a squiggly sine wave of minimal, fluctuating amplitude. Then you come to the point in your day where you perform a set of heavy Barbell Squats to failure, and the low amplitude sine wave takes a sudden, dramatic turn straight up off the paper and across the street! The distance from the flat line to the apex of the spike represents not only how much more severe the effort involved in the set of Squats, but also the much greater degree to which the body's limited resources are used up as a result of brief high-intensity exercise.

The crucial importance of strictly limiting the volume or duration of high-intensity muscular effort might be made more clear when looked at in terms of the body's capacity to cope with stress. While we are exposed to multitudinous forms of stress every day, there are three we can all identify with -- the stress of sunlight on the skin, the stress of friction on the palms of the hands, and the stress of exercise on the muscles.

Up to a very definite point, exposure to intense ultraviolet sunlight will lead to the formation of a tan. One minute more exposure than that required to stimulate the formation of a tan, however, results in a burn. Carried to radical extremes, overexposure to the sun's intense rays will cause stroke, poisoning and even death. Having exceeded the threshold point, the body's recuperative subsystems are no longer able to successfully cope with the stress of the sun, and the skin breaks down and burns.

The formation of a tan is the result of a compensatory process of the body designed to allow us to cope more successfully with the same stress in the future, which is to say with less disturbance of the body's resources. The burn is an example of a reverse process of depletion; instead of building up a protective barrier (tan), the body decompensated and lost tissue (burned).

The buildup of a callous on the palm of the hand is the result of a similar process. The skin of the palms, which protects the hands from constant contact with abrasive objects, is generally much thicker than the skin on other parts of your body. But the repeated handling of extremely rough objects, like the knurled grip of a barbell, may be too abrasive for even the palms to endure without breaking down.

If friction is abrasive enough, the formation of a callous will be stimulated. And if the amount of friction is not sufficient to wear away the growth of a callous as it is forming, a callous would indeed be produced. While the friction has to be intense enough to stimulate the formation of a callous, too much would cause the skin to wear away completely.

Here again, as with the stress of sunlight, the stress of friction on the palms of the hands will result in a compensatory buildup of tissue, in this case a callous, that will help prevent the wearing away of the skin when exposed to a similar stress in the near future. Carried to extremes, however, the body won't be able to build up the callous rapidly enough to compensate for the demands placed on it, and a reverse process of depletion will occur, eventually tearing the skin away altogether.

Exercise, too, is a form of stress. Intense exercise can result in the production of a compensatory buildup of muscle tissue which enables the body to cope with the same stress again in the near future with less disturbance to the body's limited reserve of resources. When carried on beyond the least amount required to stimulate the adaptive response, the excess drains the reserve of resources needed for recovery, and thus prevents the buildup of added muscle tissue.

The amount of stress that the body can successfully cope with is directly related to the intensity of the stress. While the stress must be intense enough to stimulate an adaptive, compensatory buildup of muscle tissue (as no amount of stress below the required level will produce the desired effect), only a very small amount of high-intensity stress is required

to stimulate the buildup of new tissue. And the greater the intensity, the less the body will tolerate before decompensating, i.e., lose strength and mass.

Now that it is understood that intense exercise must not be carried on beyond the precise, or least, amount required to stimulate an adaptive response, how does one go about discovering just how many sets that is?

One could start an experiment with an arbitrary number of sets, such as 20. But if 20 sets doesn't work -- and by "work," I mean yield continuous strength increases -- where do you go? Up to 21 sets, or down to 19 sets? Such an approach, besides being time consuming, may, for a variety of reasons, never provide the answer.

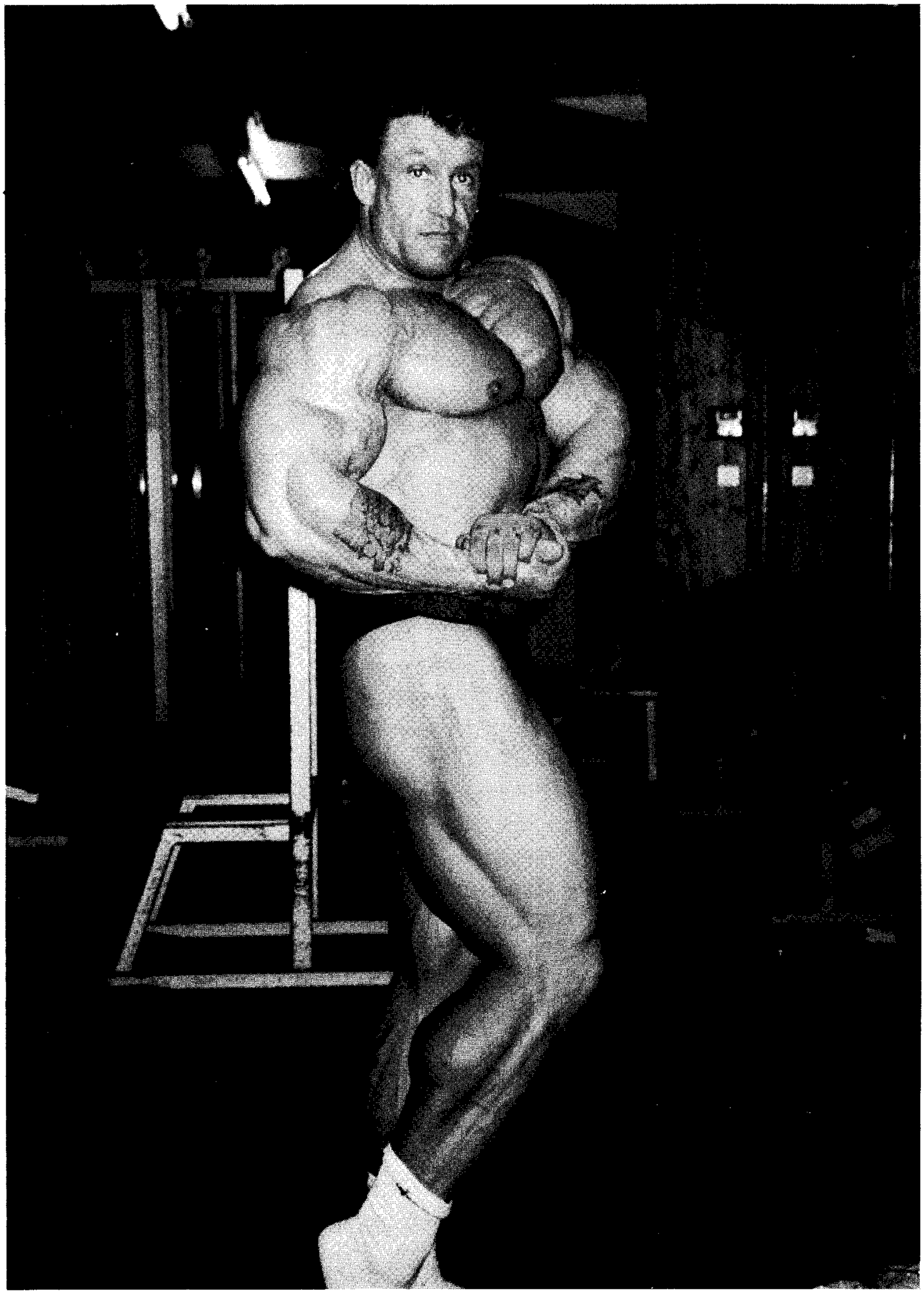
The logical place to launch an investigation aimed at discovering the precise amount of exercise required is with the least amount possible, which is one set. Even if you were skeptical that one set would be sufficient -- such skepticism being the result of thinking still distorted by the premise "more is better" -- starting with the least amount possible is only logical because if one set doesn't work, you have only one direction to go, which is up, since you can't perform zero sets. If one set doesn't work, then there is a reason, a justification, for going to two sets. (And I can state unequivocally that based on my own training experience and working with all of my personal training clients, one set per exercise, and at the most, three sets per muscle, is all that is required.)

Now that I've covered the first two fundamental principles of productive bodybuilding exercise, namely, that exercise must be intense and brief, there is a third one to consider -- frequency of exercise. Having stressed the body sufficiently with high-intensity training, you must then leave it alone, and not exercise any further, in order to allow the body time to respond with a compensatory buildup of new tissue. While growth stimulation takes place almost immediately, the actual production of growth does not. Adequate rest is needed. Following a high-intensity workout, up to 72 hours of rest (and in some cases more) is needed for growth to occur.

Many bodybuilders wrongly believe that a split schedule of six days a week (training half the body one day, the other half the next day) provides the rest required for optimum growth. This doesn't work because exercise always has a generalized effect on the entire physical system, as well as a localized one on specific muscles. So even though these bodybuilders may be affording their alternately worked muscles rest on a six-day split, they are not providing the needed rest for the overall physical system.

The tendency among enthusiastic bodybuilders, once they witness a halt in progress, is to increase both the volume and the frequency of their workouts. The continued misapplication of an endurance, "more is better" training principle is not the solution to breaking through impasses in progress. This tendency must be kept in check and avoided at all costs.

As a bodybuilder progresses, i.e., grows larger and stronger, the likelihood of overtraining looms ever greater because the demands on his body's recovery ability increase, too. It has been estimated that from the time an individual starts training he has the potential to increase his strength some 300%, while his capacity to tolerate exercise increases by only 50%. All of this points to the fact that when progress comes to a halt or you start decompensating,



*Dorian Yates displaying the results of high-intensity, Heavy Duty training.*

i.e., losing strength, rather than increasing the volume and frequency of your workouts, you should decrease them.

# Conversations with Dorian Yates

When Dorian Yates was in Los Angeles five months prior to the 1992 Mr. Olympia, he told me that he was not satisfied with his progress. He had allowed the number of sets he was performing for each bodypart to creep up to six. Although he was reluctant to accept my conclusion that he was overtraining, he did allow me to supervise his biceps workout that day. The biceps workout consisted of one set of Nautilus Curls carried to failure, at which point I helped him into the fully contracted position and had him hold it there for 15 seconds, before lowering under strict control. Dorian didn't say much other than he liked the tremendous pump -- and with that, he left the gym.

Thinking the matter was closed, I was surprised to see Dorian the next morning at Gold's Gym eagerly seeking me out. "Mike," he said, "I wouldn't be here talking to you now but, I swear, I woke up this morning and my biceps were bigger. Would you train me for the next two weeks while I'm here, so I can go home to England and use the one-set-per-exercise idea for my Olympia training?" Having agreed, I supervised each of Dorian's three weekly workouts for two weeks, none of which lasted more than 30 minutes.

One month after the 1992 Mr. Olympia, which, according to all reports, he won easily, Dorian was back in Gold's Gym during a stop on an exhibition tour. Convinced that the abbreviated system had helped him gain more muscle and win the Mr. Olympia, he asked me for further advice on how he could continue to make even greater progress for the 1993 Olympia.

My advice was delivered in the form of a challenge. "Dorian," I declared, "I doubt that there has ever been a top bodybuilder who developed to the absolute upper limit allowed by his genetic potential. Why? Because none of them had ever understood, or used the one valid theory of bodybuilding exercise; and I, who understood it, didn't make the proper application. The one major training mistake I made was that, despite having been the arch-advocate of lesser training, I was still overtaining, i.e., training too long and too frequently.

"While Arthur Jones contributed enormously to our knowledge with his general theory that exercise must be intense, brief and infrequent, it is apparent to me now that he, too, wasn't clear on the practical application. He had issued what, in essence, was intended as a surefire prescription for everyone at all times -- train the entire body three times a week. What I have come to understand much more clearly over the last two years, as a result of having trained and kept records on some 200 individuals, is just how demanding high-intensity training really is. And that when an individual is regulating the volume and frequency of his training properly, he should be witnessing progress on a very regular basis, if not workout to workout.

"Something else I learned is that there exists a wide range of variation among individuals with regard to their ability to tolerate intense exercise. Just as there exists a broad continuum

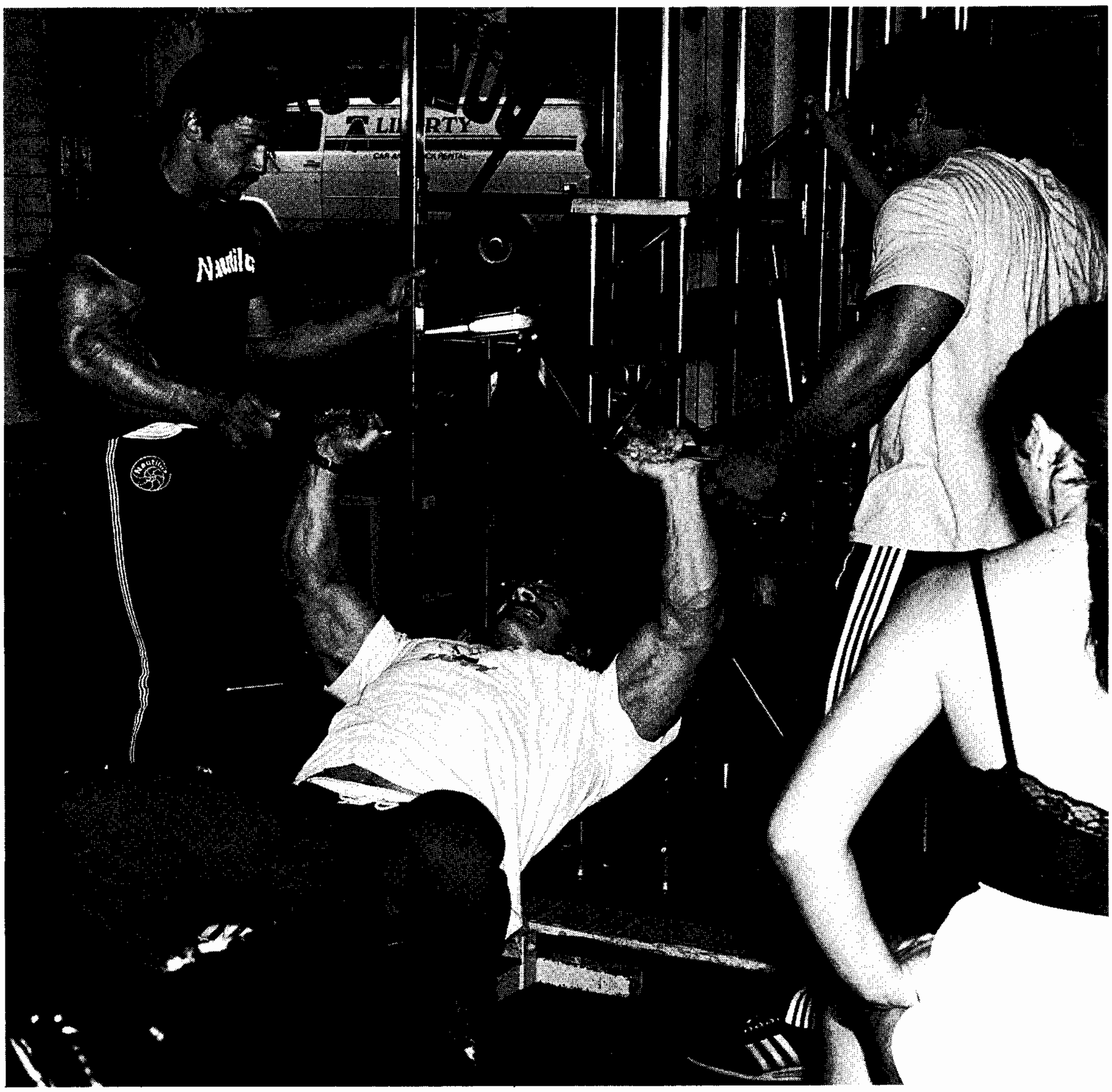
of expression of genetic traits such as height, with midgets at one extreme and the giants of the NBA at the other, or intelligence, with morons and geniuses representing the extremes, so it goes with individual recovery ability. And not only does this variability exist among individuals, but as you already know, a given individual's tolerance will diminish as he grows larger and stronger.

"Most bodybuilders are only dimly aware that overtraining means something negative. It is, in fact, the worst training mistake they can make. Especially you, Dorian, considering your prodigious strength and size, must be willing to regulate the volume and frequency of your training. The question you should be asking yourself is not how much exercise do I need, but how little do I require.

"I understand you pride yourself on being a radical individualist. Well, then, to hell with what others have thought or done. More muscle is what you're after, not approval from the pack. Break with tradition intellectually and physically. Work with these ideas, and set a new and higher standard of bodybuilding excellence. So what if you find yourself spending only 12–15 minutes in the gym every four or five days. Become the first Mr. Olympia to improve dramatically on an already heavily muscled physique. Be the first Mr. Olympia to reach the upper limit allowed by his genetic potential."

Will Dorian work with these principles and become the greatest bodybuilder in history? Only time will tell. What's more important is will you, the reader, utilize the knowledge acquired as a result of reading this book, and realize the upper limit allowed by your genetic potential? As I stated in chapter 2, neither Dorian nor myself knew at the outset of our bodybuilding careers what the future held. While not everyone who bodybuilds is interested in becoming Mr. Olympia, there are those who will settle for nothing less. Maybe one of you reading this will someday be the new standard-bearer.

In the next chapter, I will outline a training program that incorporates the principles elucidated above.




*Casey Viator and Ray Mentzer help Mike complete a forced rep in the Incline Press.*

# 4

# The Ideal (or Principled) Routine

By this point, it should be clear to you that for a workout to be productive, it must stimulate growth. And once stimulated, growth must be allowed to take place. This means that training must not be carried on so long, nor repeated so frequently, that it depletes the body's biochemical reserves in an attempt to compensate for the merely exhaustive effects of the workout, leaving nothing for overcompensation, i.e., growth production.

An ideal workout, therefore, would: 1) Induce maximum growth stimulation, and 2) Use up a minimum of the body's reserves. With a properly conducted high-intensity training program, these two requirements of an "ideal" workout would be fulfilled. High-intensity effort is an absolute requirement for stimulating increases in strength and size, and since high-intensity training must be of short duration, it depletes relatively little of the body's resources. The routine that follows later in this chapter was designed with these requirements in mind.

## Ensuring Optimal Progress

A general theory is formulated by using logic to relate and connect abstract ideas (i.e., principles) without contradiction to establish a consistent, unified structure of knowledge. In chapter 3, I presented a detailed discussion of the general theory of productive bodybuilding exercise whose fundamental principles are that exercise must be: 1) Intense, 2) Brief, and 3) Infrequent.

Starting out in possession of just a general theory, however, isn't sufficient to ensure optimal progress. In addition, certain subprinciples must be understood and implemented

to guarantee the effective utilization of the fundamentals.

A bodybuilder who only knows that exercise must be intense, but has no ancillary knowledge of the principles of full muscular contraction, will be prompted merely to move the weight from Point A to Point B with no thought given to actual exercise technique. The objective requirements of productive exercise can be understood only after first grasping the nature of muscular contraction.

Muscles are not capable of performing varying degrees of work. That is to say a muscle contracts as hard as it can or not at all. When lifting a weight, it is not all of the fibers working to a small degree; it is only the exact number of fibers required contracting to the limit of their momentary ability. This is known as the "all-or-nothing" principle of muscular contraction.

In order to induce maximum growth stimulation, all -- or as many as possible -- of a muscle's fibers must be involved in a contraction. To achieve this, the load imposed must be heavy enough so that all of the fibers are required to move it. And according to Arthur Jones, because muscles perform work by reducing their length, it is necessary that the muscle be in the fully contracted position for all of the fibers to be activated. In no other position can a full muscular contraction be achieved.

The problem with many conventional or free-weight exercises is that they provide no resistance in the fully contracted position. In the Squat, for example, when the legs are straight in the fully contracted position, there is no effective resistance at all. Likewise, in the top or fully contracted position of a Barbell Curl, where it is so important to have effective resistance, there is none.

Only Nautilus and Hammer exercise machines provide for the possibility of full-range resistance exercise. If you are one of the many who doesn't have access to such equipment, don't despair. The implementation of the principles discussed below will prove significant in helping you to achieve the intense muscular contractions required to induce optimal growth stimulation -- and allow for the production of growth.

# Proper Exercise Performance

Studies conducted with subjects standing on a force plate while lifting a barbell have revealed that exercises initiated with a sudden thrust, and completed rapidly, apply resistance to the muscle only at the start and the end of the movement. Exercises that are begun smoothly, and carried through to completion in a relatively slow and deliberate fashion, apply resistance more evenly to the entire length of the muscle, which makes the exercise more productive. It was discovered in these experiments that when the speed of the movement exceeded a certain rate, the force of momentum came into play and was responsible for completing most of the work. Momentum is an outside force that reduces muscular involvement, reduces the intensity of the contractile effort, and, thereby, reduces results.

For the best results, perform all of the exercises through a full range of motion in a reasonably strict manner. Initiate each rep deliberately, with no sudden jerking or yanking, and proceed relatively slowly through the positive range of motion to the contracted position,

at which point you should pause briefly before lowering under control. The lowering of the weight is just as important as the lifting, so don't forget to accentuate the negative.

## Training to Failure

Many bodybuilders don't get optimal results due to their reluctance to train to a point of momentary muscular failure. To stimulate increases in muscular strength and size, it is imperative that you regularly attempt the momentarily impossible. For example, if you can curl 100 pounds for 10 reps, but never attempt the 11th, your body has no reason to enlarge upon its existing capacity. It is only by regularly attempting to go beyond your existing capacity that inroads are made into your body's reserve capacity, and since reserves are limited, the body compensates with increased size and strength so that the same workload in the future won't use up the precious, limited reserve.

Contrary to widespread opinion, the last rep of a set carried to failure is not the most dangerous. In fact, it should be the safest, because by the last rep you are actually at your weakest, barely able to generate enough force to complete it. It is the first few reps, when you are strongest and able to generate more force than that required to complete them, which tend to be the most dangerous.

So don't terminate any of your sets -- except for warm-ups -- short of failure for fear that it is dangerous. You would even do well to have a training partner assist you, on an occasional basis, in completing two forced reps immediately at the conclusion of a set carried to failure. But his assistance should not enable you to perform those two reps easily; on the contrary, he should help you just enough so that you are barely able to complete them despite your greatest effort.

## Proper Weight Selection

It is suggested that you select a weight for each of the listed exercises which allows for the performance of approximately 6–10 reps in the manner described above. Never terminate a set, however, just because a prescribed number of reps has been completed. The range of 6–10 reps is offered as a guideline, because fewer than six will not tax your reserves sufficiently, and more than 12 could cause you to terminate the set due to cardiorespiratory insufficiency before muscular failure is reached.

It is absolutely essential that you don't select a weight which is so light that the last rep -- one that is within or close to the suggested range -- requires anything less than 100% of your momentary ability, nor so heavy that you are forced to sacrifice proper exercise form. If you cannot hold the weight in the contracted position without having it fall back, it is too heavy. Since all of your skeletal muscles have greater ability in holding weights than they do in lifting them, you should be able to hold a weight that you lifted by the force of muscular contraction alone at any given point in the range of motion (such as the contracted position). If you can't hold the weight you selected in the contracted position, then you didn't

*Mike Mentzer's muscles were not only massively developed, but also chiselled and striated.*

lift it -- you threw it!

As you grow stronger, and find that you can perform 12 or more reps with a weight that originally allowed for the performance of 6-10 reps, increase it by 10-20%, or any amount necessary, so that you are forced back to 6-10 reps once again. Such is the nature of progressive resistance exercise.

## The Pre-Stretch

Try to pitch a baseball without the usual windup. Attempt to throw a punch without first pulling back your arm. Observe how high you can jump vertically without the preliminary quick drop into a crouch. You will see your baseball land but a short distance away; your punch wouldn't rock Caspar Milquetoast; and your upward leap will barely get you off the ground.

The essential factor missing in all three examples, accounting for substandard performance, is the pre-stretch. The pre-stretch, known technically as the myotatic reflex, can be used effectively in any exercise where a full extension with a slight extra stretch can be achieved safely. Some examples are Preacher Curls, Calf Raises, Dumbbell Flyes, Dips and Pressdowns.

When you want to use the pre-stretch, begin by lowering the weight slowly and then, suddenly, a couple of inches from full extension, pick up the speed through to the fullest extension you can safely reach, whereupon you quickly reverse the direction of the movement upward. This extra stretch, accompanied by a quick contractile effort to move the weight in the opposite direction, sets up a strong neurological impulse that will help to make the contraction more intense.

## Pre-Exhaustion

We learned in the last chapter that in order to pass through the break-over point, the individual has to exert 100% of his momentary ability. With many conventional exercises, it is not always possible for the muscles involved to exert 100% of their contractile ability because of the involvement of "weak links."

When performing Incline Presses, for example, the working of the pecs is limited due to the involvement of the smaller and, hence, weaker triceps. A point of failure in the Incline Press would be reached when the triceps give out, well in advance of the bigger, stronger pecs. A similar situation exists when training the lats with conventional exercises such as Rows, Chins or Pulldowns. The biceps are worked along with the lats in these exercises. Since the biceps are weaker, a point of failure will be reached when the biceps fail, leaving the lats largely unstimulated.

Weak links can be overcome by performing an isolation exercise prior to a compound exercise. Carrying an isolation exercise, such as Dumbbell Flyes, Cable Crossovers or Nautilus Pec Deck, to failure will pre-exhaust the pecs while preserving much of the strength of the triceps. When following the isolation exercise immediately with a compound exercise, such

as Dips or Incline Presses, we find the situation temporarily reversed. Now the triceps, instead of being weak links, have a temporary strength advantage, and will thus serve the pre-exhausted pecs, which can now contract to 100% of their momentary ability. Similarly, the weak link of the biceps can also be overcome when working the lats. By performing an isolation movement, such as Nautilus Pullovers, Dumbbell Pullovers or Straight-Arm Pulldowns, prior to a compound movement, such as Rows or Pulldowns, the weak link is removed, and the lats receive full stimulation with the compound movement.

There must be no delay in going from the isolation exercise to the compound exercise, however, since even a three-second delay will enable the primary muscles -- the pecs and lats -- to recover up to 50% of their strength, thus making the auxiliary muscles a weak link again. Once the isolation-compound superset has been completed, there can be a rest period for as long as is necessary -- though no longer! -- before resuming with adequate efficiency.

# Negatives

The skeletal muscles all have three levels of ability. The first, and weakest, level is referred to as positive strength, which is the muscle's ability to raise a weight from a position of full extension to one of full contraction. The second level of ability, or static strength, is greater than the positive strength. This means that a muscle can hold more weight, at any given point in the range of motion, than it could raise from full extension to full contraction. The third level of ability, known as negative strength, is the greatest, and refers to the lowering of the weight from the fully contracted to the fully extended position. An individual capable of curling 100 pounds for a maximum of one rep would find that he could hold up to 150 pounds at any point in the range of motion, and lower considerably more than he could hold.

Your training intensity could be increased by performing negative reps immediately at the end of a set carried to a point of failure or, occasionally, after the two forced reps which were described earlier. The first couple of these negative reps will seem relatively easy, and you'll be able to lower them very slowly. You will find that you can even stop the downward motion of these first two negative reps because your static strength is still intact. As you proceed, the downward speed of the weight will increase and you won't have as much control. By this time, your static strength will have been exhausted, though you will still have sufficient negative strength available to complete approximately two more lowerings of the weight. The set should be terminated when you find yourself no longer able to control the downward motion of the weight, or even a rep or two prior to this point, since it is dangerous to have a weight yank a muscle out of the contracted position.

Occasionally, you might forego the positive portion of the rep entirely (with certain exercises that allow it) and perform the exercise in "negative only" fashion. Start the exercise in the contracted position with the help of two spotters who raise a weight for you that is 25-40% heavier than you would use ordinarily in a set carried to positive failure. Have them transfer the weight to you carefully so you don't injure yourself, then lower the weight slowly for up to six reps or so in the manner described above.

It was discovered in research conducted by Arthur Jones in the early 1970s that negative training could be very productive. I have found with my personal training clients, however, that including forced and negative reps at the end of every set quickly leads to overtraining. So I have my clients use them on a random basis (every third or fourth workout perhaps) but never with every exercise of a workout. If you train alone, you won't be able to do forced reps and negatives at all since spotters are necessary. Always carry your exercises to a point of positive failure, however, or the intensity will be too low to stimulate an increase.

## Warming Up

Before starting a workout, it is important that you spend some time warming up the muscles that are to be trained. It is not necessary, however, that you stretch all the major muscles, perform aerobic work, or engage in any more exercise (even light to moderate exercise) than the minimum required to limber up and bring blood to the specific muscles and joints you are working that day.

Remember that overtraining means doing any more exercise than the least amount required to achieve the desired result. This applies to warming up as well. There has been a tendency among bodybuilders over the last five years to regard stretching and aerobics as integral parts of a bodybuilding routine. There is no good reason in a weight training workout why you should waste any of your body's limited resources on non-productive exercise such as stretching and aerobics.

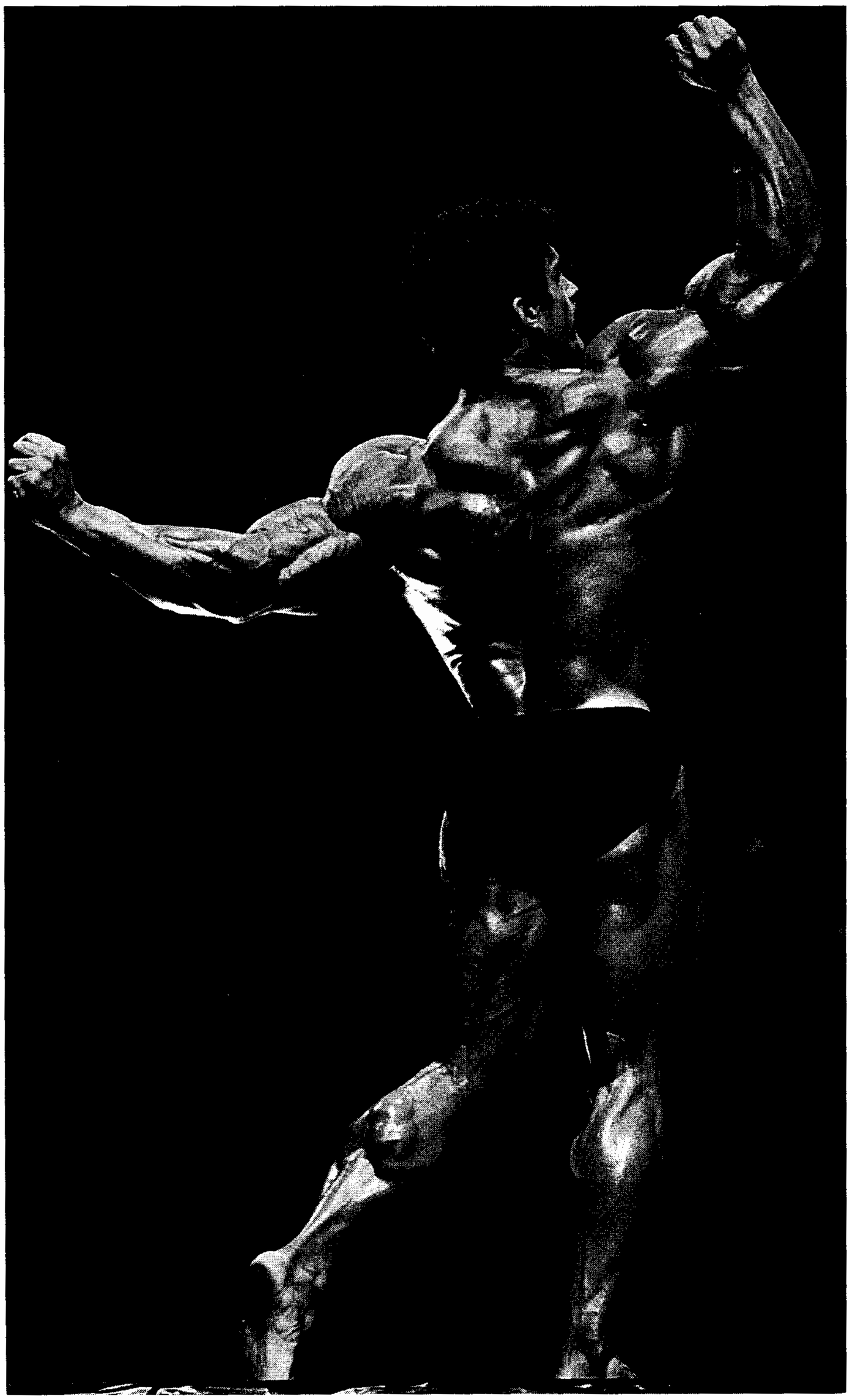
Warming up the muscles you are working is beneficial because it not only brings extra warmth, blood and oxygen to the area, but it also activates various enzyme systems, all of which contributes to the muscles being able to contract more intensely, and with less likelihood of injury.

Limit your warm-ups to the beginning of the workout, immediately prior to working the first muscle. I have learned in my own training experience, and in working with others, that two or three sets done with progressively heavier weights, each set terminated two reps or so shy of failure, is sufficient. Once that first muscle has been warmed up and then trained with maximum intensity, there is no need to warm up the other muscles to be trained later in the session. For instance, when you warm up and then work the pecs, the shoulders and triceps also become warmed up in the process and are ready to be worked intensely. Individual warm-up needs may vary, however. The point here is: Don't turn your warm-up into a workout; do only what is minimally required.

## Intensity and Muscular Function

Most bodybuilders mistakenly believe that the primary function of the biceps is to flex the forearm. On the contrary, the primary function of the biceps is to supinate the hand, i.e., turn the palm up. Only when the hand is in the supinated position will the biceps contract during flexion of the forearm.

Pull your forearm against your upper arm, with your hand pronated in the gooseneck



*Mr. Heavy Duty in a classical pose made famous by John Grimek in the 1940s.*

position; then place the tip of the index finger of your opposite hand on the bicep of your goosenecked arm and feel what happens as you slowly supinate that hand. The bicep goes from being relaxed to being contracted.

This clearly points to the fact that a straight bar should be used when doing Curls for the purpose of developing the biceps. It contraindicates the use of the E-Z curl bar, which moves the hands away from the supinated position toward the prone position, and works primarily the brachialis.

Many bodybuilders, having only a vague understanding of the function of the lats, believe that wide-grip Chins and Pulldowns are superior exercises for making the lats wider. The facts indicate otherwise. While there is no lat exercise, performed with any variety of hand spacing, that will specifically "widen" the lats, it is true that any lat exercise performed with sufficient intensity will develop -- and, thus, widen to some degree -- the lats over time. Lat exercises performed correctly will, of course, be more effective in developing that muscle.

Imagine a latissimus muscle as a rubber band stretched and attached between two points -- one on the upper arm under the tricep, and the other along the lower back. Now place your upper arm alongside your head, as in a close-grip chin or pulldown position. The two attachment points of the lat in that position are almost 180 degrees apart, providing a considerable stretch to that muscle. Upon moving your arm away from your head closer to the wide-grip position, note that the angle between the two attachment points is getting closer to 90 degrees, where there is considerably less stretch.

For greater stretch and a fuller range of exercise for the lats, use a close grip when performing Chins and Pulldowns. Also, it's better to use a supinated hand placement with these two exercises. Because the biceps are smaller and weaker than the lats, they will fail in the chin and pulldown exercises before the lats. Why compromise the productiveness of your lat work by placing the palms in the prone position where the biceps are weakest? Close-grip, palms-up Chins and Pulldowns are best for fully productive lat work.

When working the pecs with any kind of bench press movement -- whether flat, incline or decline -- it is best to keep the hands as close together as comfortably possible. The function of the pec is to bring the upper arm from any position beside the body into and across the midline of the torso. Place your arms out in front of you, as in a wide-grip bench press position, and contract your pecs. Then move your arms closer together, as in a close-grip bench press position, and contract your pecs. The intensity of the contraction is much greater in the close-grip position. It is not the hands that should be spaced wide when doing Benches, but the elbows. With the elbows placed wide and back toward the ears, the upper arms are furthest away from the torso, and with a close grip, the upper arms can come closer to the midline of the torso -- all of which makes the pecs work through a fuller range, and, thus, provide for a more intense contraction.

*Ray Mentzer on the Nautilus Curl Machine.*

# Equipment

There has been a controversy raging for almost two decades in the bodybuilding/fitness market concerning the merits of free weights versus exercise machines. The issue, as just stated, however, is not accurate. The actual issue involved is: Are there any exercise machines that are better than free weights? And the answer is . . . YES!

There is no denying the fact that the barbell is a productive tool -- when used properly -- as the vast majority of champion bodybuilders and strength athletes have used it almost exclusively. This does not alter the fact that the barbell has certain shortcomings.

For a proper understanding of the shortcomings of the barbell, a few basic facts pertaining to the physics of exercise must be considered. While our various bodyparts move in a rotary fashion about an axis, most conventional free-weight equipment provides only "straight-line" or undirectional resistance. This accounts for the fact that with most free-weight exercises, the weight feels heavier in some positions than in others, and very rarely is there any resistance at all in the fully contracted position. As stated earlier, the fully contracted position is the only position where it is possible for 100% of the muscle fibers to be activated, but only when there is sufficient resistance provided.

The Barbell Curl, for example, a movement that is rotational through 160 degrees, provides effective resistance in only a small portion of the range of motion. It is only at the midpoint in the curl, where the forearms are perfectly parallel to the ground, and gravity is pulling straight down while you are pulling straight up, that the resistance is direct and, thus, fully effective. Once the weight passes through the midpoint in the range of motion, the effective resistance falls off, and the weight feels considerably lighter, with no resistance in the contracted position.

In barbell exercises where a lockout is involved, the resistance is not sufficient in the contracted position to induce a full contraction. This is a major shortcoming of the barbell as, again, the contracted position is so important to growth stimulation. Examples of barbell exercises where lockouts occur are Squats, Leg Presses and all pressing movements for the upper body. In the lockout position, most of the effective resistance has been removed and is supported by the bones, which are in a straight-line position.

The existence of a sticking point in many barbell exercises -- that point in the range of motion where the resistance is experienced as much heavier than at all other points -- makes it clear that the muscles are being worked harder in some positions than in others. In a lockout, where the weight can be supported with little or no muscular involvement, the muscles are barely worked at all.

All of this demonstrates that barbell exercises provide resistance to the muscles only in their weakest positions, with little or no resistance in their strongest ones. It is important that you be aware of these facts when choosing exercise equipment, because where there is no resistance, there is little growth stimulation -- and this is precisely the situation we find in the contracted position of most barbell exercises. There are barbell exercises, of course, that are productive in spite of these limitations, though not nearly as effective as they would be without such limitations.

So to answer the question: Are there any exercise machines that are better than free weights? Yes, there are two that I recommend very highly. The best exercise equipment available is Nautilus. Arthur Jones, the source of the above information concerning the physics of barbell exercise, created the Nautilus machine to provide direct, balanced, automatically-variable, full-range resistance exercise. The second best exercise equipment, created by Gary Jones (Arthur's son), is Hammer, which has many of the same features as Nautilus.

It should be understood that prior to the advent of the Nautilus machine in the early '70s, no one was issuing polemics against exercise machines. Even today, you never hear anyone denigrate the leg-extension machine, the calf machine or the lat-pulldown machine. It was only with the resounding functional superiority and financial success of Nautilus that we started hearing the anti-machine rhetoric emanating from the manufacturers and sellers of conventional equipment.

I have my personal training clients use Nautilus and Hammer almost exclusively. In addition to the fact that they provide full-range resistance, I like the fact that, when using guided mechanisms, my clients can focus all of their effort against the resistance and, thus, achieve more intense contractions. With many free-weight exercises, too much of the effort is wasted on balance and coordination.

If you train at home, or don't have access to full-range exercise machines, significant results can still be achieved with conventional free-weight exercises, as long as you adhere to the basic principles of productive exercise.

# Regulating Volume and Frequency

The training routine outlined at the end of this chapter will yield you an immediate, significant strength increase. In time, however, you will see your progress come to a halt. That doesn't mean you should discard the general theory. You will still require intense muscular contractions to stimulate growth. But as you grow stronger and lift heavier weights, the demands on your body's still limited reserves increase also, and the same routine will amount to overtraining.

After noting that progress has ceased entirely for two weeks, take one week off from training so your body can fully replenish its reserves. Upon resuming training, eliminate one set from each of the three workouts, and reduce the frequency by adding an extra day off between workouts. The lay-off, along with the reduced volume and frequency of training, will put you back on the path of progress once again.

As I said in the previous chapter, the general theory of productive exercise -- train intensely, train briefly, and train infrequently -- is valid and will work for everyone. However, since there does exist a wide range of variation among individuals in their ability to tolerate intense exercise, I can't guarantee a universal fail-safe prescription. Some of the practical application of the theory will have to be worked out by the individual. If the listed routine doesn't yield immediate, significant results, work with regulating the volume and frequency until such results are forthcoming.

# The Routine

DAY 1
**Pecs**: 1. Dumbbell Flyes, Cable Cross or Pec Deck,
supersetted with...
2. Incline Presses.
**Delts**: 1. Laterals.
2. Bent-over Dumbbell Laterals (or Pec Deck for rear delts).
**Triceps:** 1. Lying French Presses, Pressdowns or Triceps Machine,
supersetted with...
2. Dips.

DAY 2
**Lats**: 1. Pullovers,
supersetted with...
2. Close-grip, palms-up Pulldowns.
3. Bent-over Barbell Rows.
**Traps:** 1. Shrugs.
**Erectors:** 1. Hyperextensions or Deadlifts.
**Biceps:** 1. Curls.

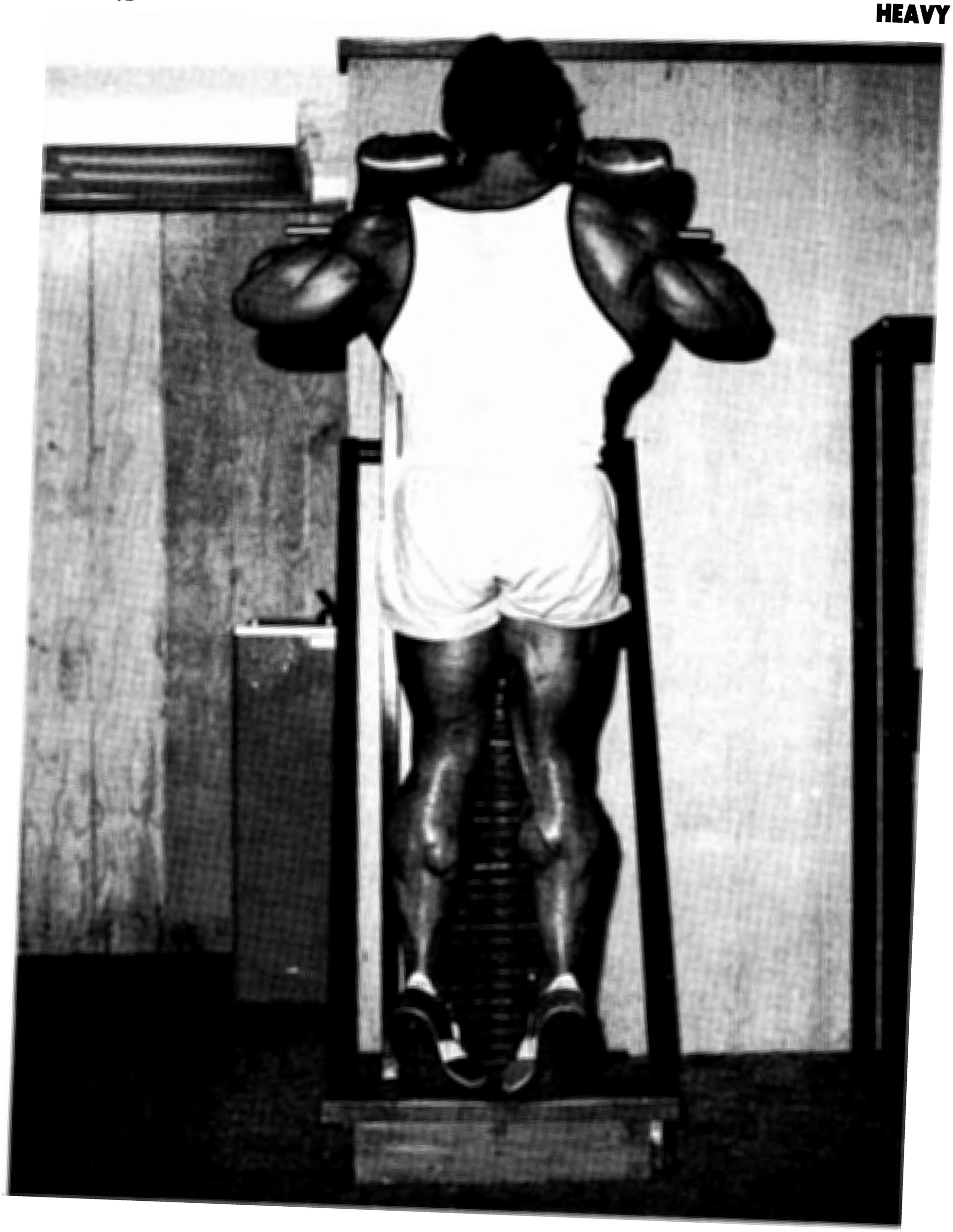
DAY 3
**Legs:** 1. Leg Extensions,
supersetted with...
2. Leg Presses or Squats (these should be alternated workout to workout).
3. Leg Curls.
4. Calf Raises.
**Abs:** 1. Sit-Ups.

# Important Points

1. Perform one set of each of the listed exercises. Even if you are skeptical that one set is sufficient, it is still the logical place to launch your investigation to determine the most efficient, productive method possible.

2. There should be no rest between exercises listed as a superset, since even a three-second delay will result in the auxiliary muscles becoming weak links. Minimize the rest time between sets not listed as a superset. Rest just long enough so that you can go into the next set without being hampered by cardiorespiratory insufficiency.

3. Strive to progressively reduce workout time. Performing the same workout in less and less time increases the intensity and, thus, the productivity of your workouts. Do not, however, allow your workouts to degenerate into a race against the clock.



*Mike Mentzer, seen here on the standard Calf Raise Machine, did make use of some conventional exercise equipment.*

4. Warm-ups should be kept to a minimum. The principle of performing no more exercise than the precise amount required applies to warming up.

5. Perform all of the exercises in reasonably strict fashion. Initiate each movement deliberately, and proceed, likewise, in a smooth, controlled fashion through the positive range of motion, pause in the contracted position, and lower under control.

6. Select a weight for each exercise that allows you to perform 6-10 reps to positive failure. As your strength increases and you are able to perform 12 or more reps, increase the weight by 10-20%, or any amount that forces you back to the 6-10 rep range. Train progressively.

7. Forced and negative reps can be beneficial, but only when used on an occasional basis. When used with every set of every workout, they soon result in overtraining.

8. In the beginning, train every other day -- either Monday, Wednesday and Friday, or Tuesday, Thursday and Saturday. At the conclusion of each three-day cycle, take two days off from training entirely.

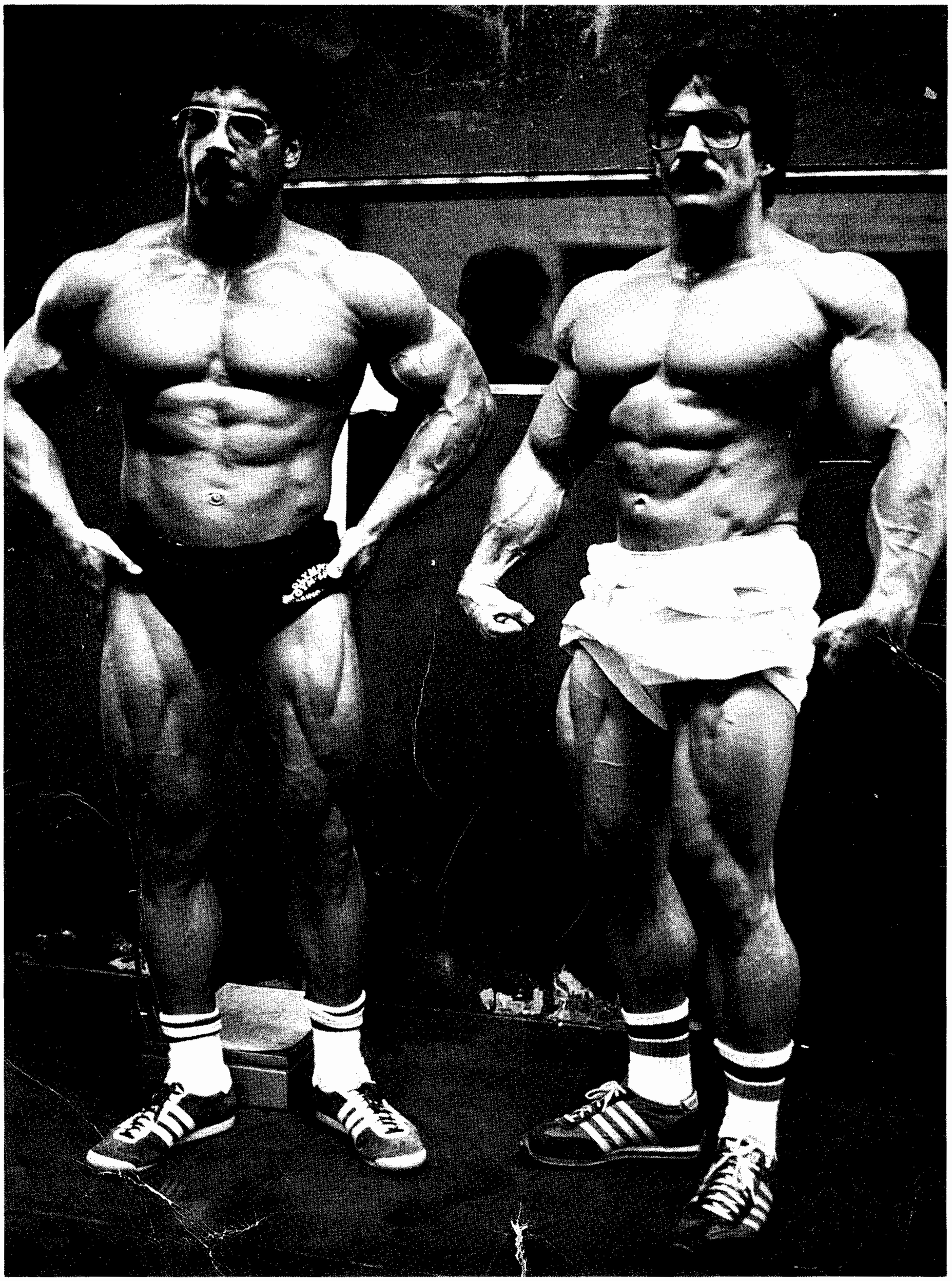
9. As you grow larger and stronger, the demands on your recovery ability become greater, and the routine will eventually result in overtraining. Evidence of this will be an abrupt halt in progress. If you experience two weeks of no progress, take a full week off from training. Upon resuming training, reduce the volume and the frequency of your workouts. On Day 1, eliminate the compound movement for triceps; on Day 2, eliminate the isolation exercise for lats; and, on Day 3, reduce the performance of the Leg Curl to every second or third leg workout. And instead of training every other day, train every third or fourth day.

10. Train for strength! Remember: If you want to get bigger, you have to get stronger. For many, strength increases precede size increases.

11. Keep a progress chart. Record the date of each workout, the amount of weight used for each exercise, and the number of reps performed. You should be getting stronger -- as evidenced by an increase in reps, weight or both -- on a very regular basis. As long as you are getting stronger, you're on the right track. Even a one rep increase is significant.

12. Exercises can be changed periodically as long as you continue to adhere to the basic principles.

13. This routine is not a guarantee of a Mr. Olympia physique. That is something that no one and no routine can guarantee, since how much muscle can ultimately be developed is a matter dictated by genetics. Utilizing the training principles elucidated above, however, will help to ensure optimal progress and the actualization of an individual's full physical potential.



*Mike Mentzer is the first to admit that Heavy Duty training **and** favorable genetics enabled him to develop the rugged musculature displayed here.*

# 5

# Individual Potential

No bodybuilder with even a modicum of training experience needs to be reminded that muscle growth is an agonizingly slow process. It is, in fact, a harsh reality that the weight training athlete is reminded of daily. And while it is patently evident that some grow faster and to a greater extent than others, I have rarely met a bodybuilder who was ever satisfied with his rate of progress or his level of development.

Since, as I stated emphatically in chapter 3, the physiology of muscle growth is universal, and everyone possesses practically the same training requirements, you may be wondering why there exists such a wide range of variation in individual response to training.

## The Role of Genetics

It wasn't long ago that many in the field of bodybuilding believed that anyone could develop a championship physique if only he found the right routine and took enough supplements. This was revealed as a monumental superstition in the 1970s when some sorely needed knowledge from the science of genetics was applied to bodybuilding.

While it is true that the fundamental principles of exercise physiology are common to us all, it is also true that there exists a constellation of genetic factors which modify individual response to exercise. Two of the most readily recognizable factors are age and sex. There are other factors, however, somewhat less tangible, that play an even greater role in determining individual response to exercise.

Individuals inherit characteristics peculiar to their parents and not common to the species,

e.g., height, eye color, fingerprints, body type, and blood type. These are "fixed" genetic traits and, thus, are not subject to progressive alteration from exogenous influences. There do exist other inherited traits, however, such as intelligence and muscle size, that are not absolutely fixed and can be progressively altered.

The genes (hereditary material within the cells) responsible for mature body size can't find expression in an individual deprived of adequate nutrition and physical activity during the early stages of growth. A similar condition applies to the development of intelligence; severe nutritional and conceptual deprivation in the formative years will hamper, and possibly prevent, the development of a mature intellect.

These influences are crucial for the development of normal levels of physical size and intelligence. To develop above normal levels of size and intelligence, the individual must undertake the performance of tasks more demanding than those normally encountered in the course of daily life. (Those who claim intelligence is a fixed trait characteristically evade the fact that volition plays an important role in its development.)

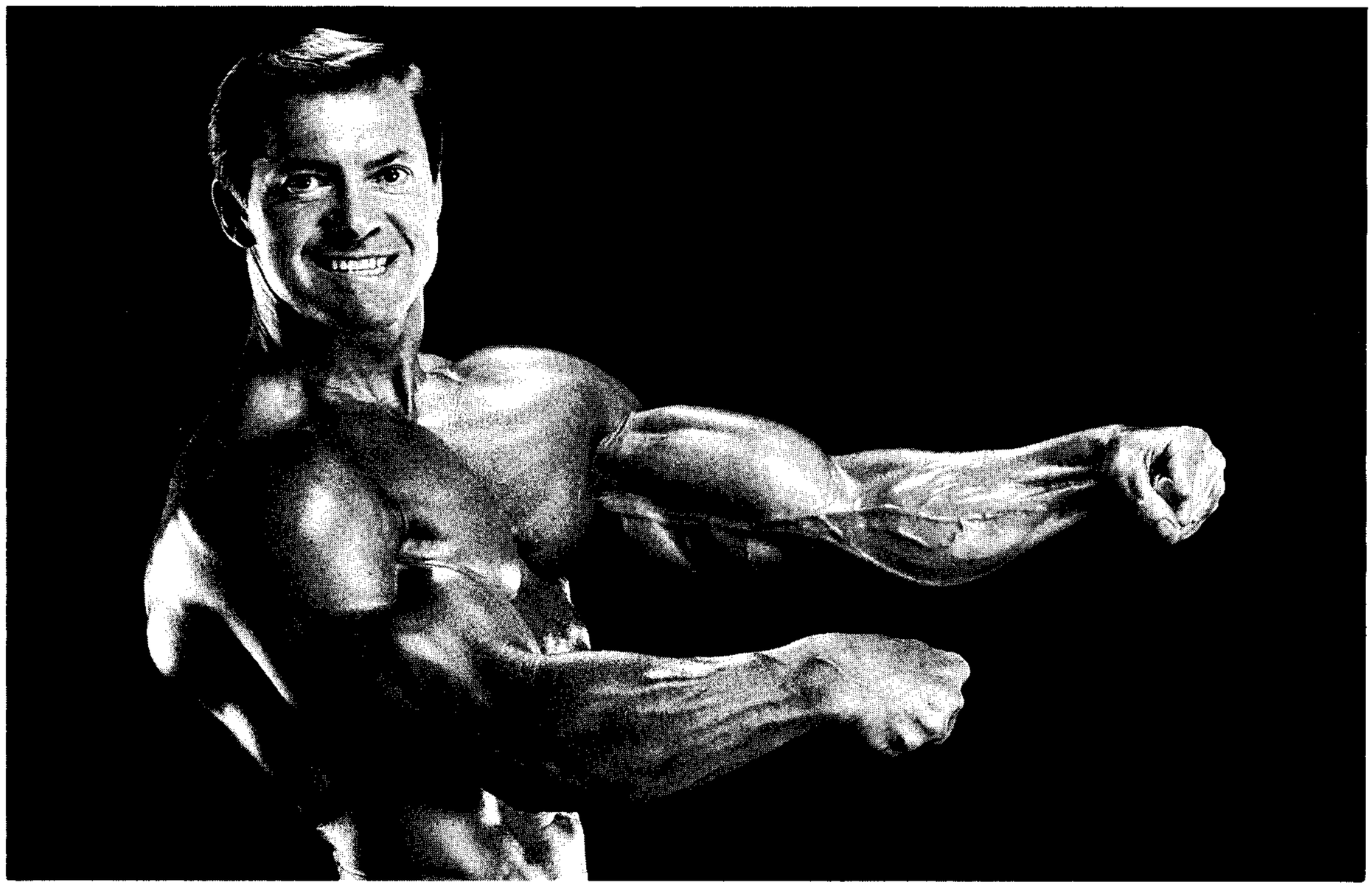
By following the advice mentioned above, anyone can improve upon his existing muscle size and intelligence, but in all cases, there are limits -- and because these limits are genetically predetermined, there is nothing you can do to transcend them.

Along with the specific psychological-motivational factors the individual must possess -- or acquire -- in order to achieve his goals (see chapter 6), genetic endowment is the primary factor in determining both the rate of response to intense exercise and the degree of muscular development. So while anyone can improve upon his existing level of development with proper training and nutrition, only a very small percentage will have the requisite genetic traits to become champions.

The most visible of these physical characteristics necessary for the development of a top physique is related to the skeletal structure. The size and formation of the bones dictates not only how much muscle can be supported, it also determines a significant aspect of the aesthetic quality of the physique.

An individual with a small or frail bone structure simply will not be able to support the Heavy Duty musculature of a Casey Viator or a Dorian Yates. Below a certain circumference and density, the bones will not be strong enough to serve as adequate anchors for muscles contracting under the heavy loads required to develop them to such a degree. Likewise, it would be literally impossible for someone who has the big-boned skeleton of a Paul Anderson to ever acquire the aesthetic flow and taper of muscle which is the hallmark of the bodybuilder's physique. While such a large skeleton would allow for the support of muscles larger than a Mr. Olympia's, it would obviate the aesthetic appeal of large muscle bellies converging into small, compact joints.

Though the size of the skeleton plays a significant role in determining how much muscle mass can be supported, the actual size potential of a muscle is determined, in part, by the length of the muscle. The longer the muscle, the greater its mass potential. I'm not referring to the length of the bone on which the muscle is situated, but rather how far the muscle extends down the bone. A familiar example of the relationship between muscle length



*The long and short of it -- Although they trained in a similar fashion using the traditional volume approach, Larry Scott (above) had longer biceps than Franco Columbu (below), and thus was able to achieve much greater arm development.*

*Ray Mentzer on the beach in Venice, California.*

and muscle size is the gastrocnemius muscles of most black bodybuilders. Because their calves are "high," the mass potential is limited, since muscle can't be developed where it doesn't exist.

Another good example is the contrast between the biceps of Larry Scott and Franco Columbu. While Scott is generally recognized as having developed the most massive biceps in the history of the sport, it was their considerable length that helped make it possible. When he posed his right arm straight out, the biceps extended beyond the full length of his upper arm into the crook of the elbow. Columbu, on the other hand, had short, knotty biceps. Although he developed them to a considerable degree, this trait prevented them from becoming as massive as would have been the case if they were full length.

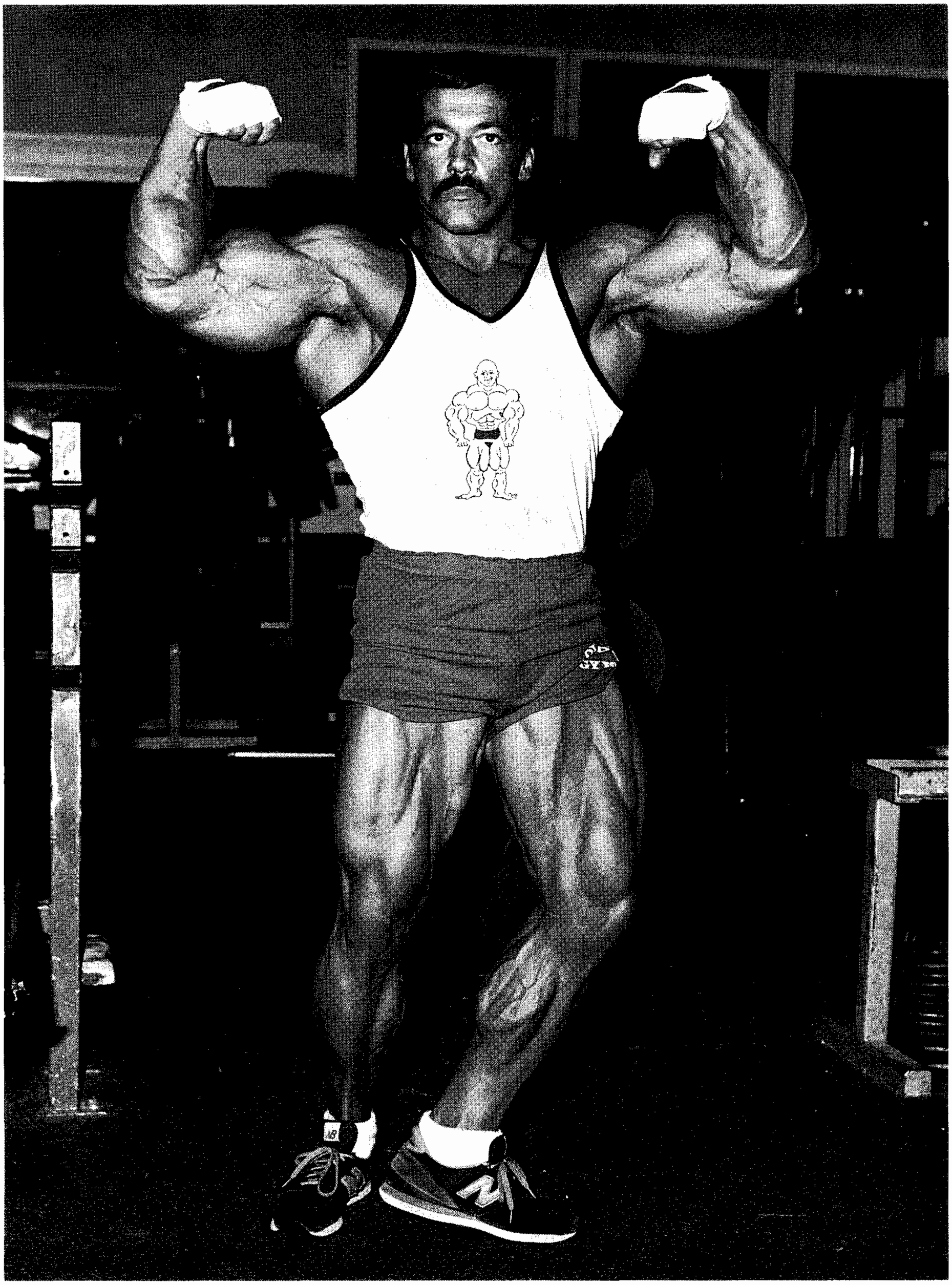
The subject of muscle length is interesting when you consider the randomization of the trait in an individual, let alone within the species. With Lou Ferrigno, for instance, we see that, while he has full-length -- not to mention *enormous* -- biceps, his calves are very high on his lower leg, which is why he has been unable to develop them to a similar degree. It is rare to see a bodybuilder who has long muscles uniformly throughout his musculature. Sergio Oliva comes to mind instantly as such a rarity. Not only were all of his muscle bellies long, but every muscle on his body was developed to an extraordinary degree.

But an individual with long muscle bellies and a perfect bone structure will not necessarily be able to develop his muscles to a significant degree since muscle fiber density also plays a crucial role. The number of fibers in a given volume of muscle, along with the length of the muscle, are just two of the factors which determine its mass potential. Everything else being equal, a bodybuilder whose pectorals are comprised of fewer fibers than his training partner's will not develop his to the same degree.

Within the human genome (total complement of chromosomes), there are coded instructions that regulate the rate and degree of response to intense exercise. I am not referring here to genes that control the traits discussed above, but those whose specific task it is to temporarily shut off the process of muscular growth that occurs in response to singular bouts of intense exercise, and then permanently once individual potential has been fully actualized. These regulatory traits, like many genetic traits, are expressed across a broad continuum, which helps explain why there exists such a wide range of variation with regard to individual response to intense exercise.

The subject of how genetics affects the development of muscle mass is extremely complex because of the large number of possible interrelationships on the part of a wide array of traits, some of which have not been identified. Those discussed briefly above are but a few; they are offered to serve merely as an introduction to the subject and to provide you with the means for ascertaining where you might be headed.

It is important, once again, that you keep in mind that limits exist in every case, and since these limits are genetic in nature, there is nothing that can be done to alter them. But remember also that ultimate potential can be accurately assessed only in retrospect, so you'll never know for certain what yours is unless you make a long-range commitment to actualize it using the proper methodology.



*Casey Viator strikes a pose during a break in one of his gruelling, high-intensity workouts.*

# 6

# On Motivation

A true story about an event that took place more than 20 years ago is still circulating among bodybuilders in gyms all over the country. The story is about a feat of strength, stamina and motivation so rare that those who were there speak of it with a sense of reverential awe, so much so that it has assumed almost mythical status.

It seems that just prior to the 1971 AAU Mr. America contest, Arthur Jones was personally supervising Casey Viator's workouts. Since the Nautilus compound was graciously open to visitors, a gathering of bodybuilders from around the country was there to watch Jones put Casey through his final thigh workout before the contest.

As I was told by Jones and others afterward, Casey launched his thigh workout that day by performing 25 nonstop reps to failure on the leg press with 750 pounds. Then, with virtually no rest, Casey jumped onto a leg-extension machine and performed 22 reps with the entire stack plus 220 pounds of additional plates.

By that time, Casey's pulse rate was in excess of 200 beats per minute and his breathing was a continuous gasp for air. But that was not the end of Casey's Herculean labor that day. At the conclusion of the Leg Extensions, which were also carried to a point of momentary muscular failure, Casey proceeded immediately to squat with 505 pounds for 12 reps. And, as Jones was fond of pointing out, they weren't merely full squats, but "ass to the floor!"

What else did Casey do for his quadriceps that day? Surely you jest! He performed no more exercise for them that day, not just because he shouldn't have, but because he couldn't have.

Neophytes might better appreciate just how extraordinary Casey's feat was when you compare it to what Sergio Oliva, Mr. Olympia and considered by many the greatest bodybuilder

in history, did, or failed to do, when he was put through the same thigh workout some time later at the Nautilus training facility. Having performed fewer reps with less weight in the Leg Press and the Leg Extension, by the time Sergio slowly staggered to the Squat, which was loaded to 315 pounds, he was so exhausted that when he broke the lock in his knees at the start of his first rep, the spotters had to return the bar to the racks as Sergio collapsed in a heap on the floor. He was able to continue, and complete a set of Squats, only after he had several minutes rest and the weight was reduced to 135 pounds.

While it is true that high-intensity training is much briefer than traditional high-set training, the severity of the effort involved is much greater and, thus, requires a higher level of motivation. A healthy, well-conditioned bodybuilder is capable of an all-out effort at practically any time; however, due to the magnitude of the physical demand, the mind will ordinarily balk unless it conceives of a compelling reason to engage the body in such an effort.

* * *

If you are a typical bodybuilder, don't despair because you occasionally find yourself falling prey to the ogre of diminished motivation. The fact that a stray bubble of doubt percolates through your consciousness from time to time should not be the cause of any undue fretting. If, however, you allow yourself to continue to focus on your fears and doubts, they will inevitably escalate in dimension until they threaten to overwhelm you.

Even the top champs -- and I mean all of them -- experience fluctuations in motivation and confidence. Don't be duped into believing that successful individuals possess some mystical endowment, and then tear your hair out wondering if you have it. Neither is high-level motivation -- and the associated self-confidence -- an accident of birth randomly bestowed upon a blessed few, but is, in fact, a trait that can be cultivated by anyone. Just as there is no mystery involving the cause-and-effect relationship between intense exercise and muscular growth, so, too, the science of motivational psychology has clearly established the mental causes that affect motivation.

# The Role of Values

All bodybuilders occasionally find it difficult to rouse themselves sufficiently to have a great workout. For a variety of reasons, ranging from lethargy or feeling merely out of sorts to a more serious erosion of emotional vitality resulting from problems at work, with a mate, or the loss of a high value, an individual may experience a disinclination to engage in any physical activity more demanding than that normally encountered in the routine of daily life. (With those who chronically overtrain, such a disinclination is easy to understand.)

When this happens, you find it nearly impossible to focus adequately on what you know you should be doing in the gym. You are barely able to summon the motivation to do anything other than merely go through the motions of a workout, and the weights feel much heavier than usual. A weight that ordinarily allows you to perform 10 reps of Curls finds you struggling

to complete even five reps.

Now visualize the following scenario: At the point when you're ready to throw in the towel, a sinister-looking character walks up to you brandishing a .38-caliber pistol and bellows the command, "Pick up that weight and curl it at least 10 times or I'll blow your brains out!" What do you do? Why, of course, you fervently pick it up and curl it, not 10 times, but 15.

The key to understanding motivation is the concept of "value." "Value" is that which one acts to gain and/or maintain. Motivation, therefore, is fueled by the desire to gain and/or keep a value.

It is the phenomenon of life that necessitates the existence of values. All lesser goals are the means to that final goal, which is the maintenance of that ultimate value -- life. When your life, or that of someone you love, is in jeopardy, you will find yourself in possession of a potential for effort you may not have known you had.

Man's mind is so constituted that he cannot keep all of his knowledge and values in his focal awareness. Yet, in order to survive, he must have some means of triggering instantaneous appraisals from his subconscious in response to his perceptions of the situations he encounters. If, for example, while crossing a street, a pedestrian perceives a truck careening at breakneck speed around a corner in his direction, rather than carrying out a conscious thought process, his subconscious instantaneously assesses the gravity of the situation and he responds automatically by lunging to safety. Providing the conscious mind with lightning-like appraisals, while bypassing any undue, lengthy thought processess, is the function of emotions.

Emotions are automatized value-responses issuing from the subconscious which, within the context of an individual's knowledge and values, indicate what is "for him" or "against him."

The motivational function of emotions is evidenced by the fact that every emotion has a kinesthetic element, or motor component, experienced as an impetus to engage in some action related to the particular emotion involved. Love, for example, is an emotional response to that which one values most highly; it prompts one to act to achieve contact or to gain possession of that value. Fear, on the other hand, is an emotional response to that which threatens one's values, and it prompts one to avoid that which arouses the fear.

Contrary to widespread opinion, there isn't necessarily a clash between reason and emotion. Your emotions, as Ayn Rand has made clear, are the products of your premises, i.e., the thinking you have done or failed to do. When you experience a conflict between your conscious, rational mind and your emotions, check your premises, and you will find a contradiction.

If, for example, you have made the conscious decision that you want to develop a more muscular physique, but cannot get motivated to engage in the actions required, there is a reason. There is a contradictory value-premise (emotion) in your subconscious that is conflicting with your decision to work out. The result is that you feel at cross-purposes and your motivation is diminished.

The solution to such a problem is to ferret out the subconscious value-premise which is at the root of the emotion and denature it (diminish the potency of it) by consciously challenging

the ideational or cognitive material involved. This, along with an intensifying of the psychological material associated with your decision to develop your physique, will, in due course, eliminate the conflict and, hence, the motivation problem. (Those with chronic, severe emotional-motivational problems are advised to seek the help of a competent psychologist.)

The ideas discussed above represent only part of the theory of human motivation. Because the subject of motivation is so vast, it is beyond the scope of this book to attempt a comprehensive, detailed study. For those who would like a fuller understanding of this subject, I recommend Nathaniel Branden's superbly written book, *The Psychology of Self-Esteem*.

# Motivational Techniques

The principles governing motivation and behavior apply to everyone. This being true, even a cursory observational analysis reveals that those who procrastinate, lack motivation, and under-achieve, do so as a result of the same self-limiting concepts. Because man's cognitive-emotional mechanism -- his mind -- is plastic, it is possible to amend thinking and behavior so you can become more productive.

The following is an outline of a few techniques that can aid you in increasing and maintaining the motivation required to achieve not only your bodybuilding goals, but all of your goals.

1. *Volitionally focusing on the positive.* At about the same time that severe depression prompted William James to seriously contemplate suicide, he fortuitously happened upon (while reading a philosophy book) the concept of "free will." Subsequently, he entered into a period of rigorous introspection, during which time he recognized and accepted that he did, in fact, possess free will, or volitional control over his mental contents. Thus taking control of his mental apparatus, James was able to rid himself of his suicidal depression, and he went on to become a prolific writer and celebrated lecturer on the subjects of philosophy and psychology.

Those who habitually focus on -- and allow themselves to become mesmerized by -- their physical shortcomings, often find themselves overcome by inertia as their "will batteries" run dry. They make a practice of evading the full context of their knowledge, and ruminate predominantly in the negative, dwelling on such things as a weak bodypart, the idea that nature didn't provide them with favorable genetics, or their "inferiority." This inevitably results in a lowering of self-esteem and diminished motivation. Successful individuals, on the other hand, have learned to value themselves by embracing the responsibility and effort of volitional consciousness. Recognizing that no one "has it all," they work with what they do have, and make the best of it. Physique great Boyer Coe, for example, although suffering a deficiency in abdominal development, didn't allow himself to become depressed. Instead, he perfected the rest of his physique, so the deficiency would be less noticeable.

The ability to direct thoughts to the positive can be developed by anyone. It is something that successful individuals in all fields have trained themselves to do by establishing, as a "standing order," the practice of monitoring their thoughts and emotions. And when a

negative, or irrational, pattern emerges, they choose to ignore it -- or challenge it -- and volitionally generate a positive, rational one.

2. *A change in attitude will cause a change in effect.* If you approach your workouts compulsively, with either an "I must," "I should" or an "I have to" attitude, they will most likely be unproductive, namby-pamby affairs, and you will find it difficult to sustain the necessary motivation. By periodically reminding yourself of the value of your pursuit -- increased stength, improved appearance, more vitality, greater self-esteem -- you can create an "I want to" attitude. And with continued serious thought, you will become convinced "all the way down" about the value of achieving your goal. When this occurs, mind and emotion are in harmony, and you'll find yourself approaching your workouts wholeheartedly with a ferocious intensity and an "I'd love to" attitude.

3. *A "mistake" philosophy.* It is not unusual for individuals to have motivational problems associated with a fear of engaging in a new activity. Whenever an individual fears attempting a new activity, it is due to an inappropriate "perfectionist" attitude. So long as the habit of routine life is maintained, such an individual will make relatively few mistakes and feels safe. The moment he ventures into a new and unfamiliar area, he fears he'll make a mistake, something he has not learned to tolerate.

Bodybuilding, like life, is a journey we embark upon awkwardly, with little or no knowledge. The result is that we make mistakes. Man is a fallible being, and even as we mature and gain knowledge, mistakes remain inevitable. Successful individuals, however, view mistakes rationally. Rather than being put off by them, they grow to regard them as valuable tools of self-correction that motivate them to actively seek the knowledge necessary for achieving further mastery.

Let's assume, for example, that after several years of regular training, you still have not developed a muscular physique. Then one day you meet someone in the gym who explains clearly and intelligently the theory of high-intensity training, and you realize that you've been making the mistake of overtraining. Instead of reproaching yourself for some perceived moral failure, or becoming hostile to the person who corrected your thinking, you make the effort to learn more and then implement your newly acquired knowledge.

4. *Self-appraisal using the appropriate standard.* As stated above, an emotion is a value-response reflecting an appraisal of either the beneficial or the harmful relationship of some aspect of existence to oneself. The most important value-judgement an individual can make is the one he passes on himself, since it will necessarily affect all of his other value-responses and, thus, his motivation.

Self-esteem -- a term widely used, but much misunderstood -- is the result of a positive appraisal flowing from the recognition that one is committed to what is true and good. It entails the sense that one is both able to live and worthy of living. The need for self-esteem is inescapable; it is inherent in everyone and is experienced as an omnipresent, basic phychological need.

Since "self-esteem" is an evaluation, it presupposes a standard of value. The quality of a man's self-esteem -- and the degree of his ambition -- will hinge on whether or not

the standard he uses is rational.

Man's biologically distinguishable trait is reason, or his ability to think. Because man is free to think or to evade that effort, it is his volitional use or misuse of that ability which serves as the only rational standard of gauging self-esteem. It is not the degree of one's knowledge or intelligence that matters, but one's commitment to reason.

Those who habitually measure their self-worth by a comparative standard often have a difficult time understanding why their confidence yo-yos. Living in a comparison-neurotic society, many base their self-esteem on how much money, how many cars or how much muscle they have compared to someone else. Because the acquisition of existential values depends, to some extent, on factors that one doesn't have volitional control over, such is an inappropriate, or irrational, standard.

The extent to which an individual can develop his muscles, as I discussed in the last chapter, is a matter dictated primarily by genetics, something he has no control over. What he does have control over is how much volitional effort he will exercise to acquire the knowledge and to develop the motivation required to train properly and actualize his genetic potential.

Interestingly enough, it is not unusual for individuals with less genetic endowment to go further than those with more. Arnold Schwarzenegger and Sergio Oliva are a good example. Despite having been "blessed" with an almost overwhelming abundance of the required genetic traits, Sergio achieved his best physical condition only on relatively few occasions. Arnold, on the other hand, while being lesser endowed than Sergio, used his free will to sustain a higher level of motivation and, thus, achieved a pinnacle of condition more frequently. As a result, Arnold triumphed in competition over Sergio more often than not.

5. *Setting goals*. Man, a being whose means of survival is conceptual, cannot live moment to moment as instinctual creatures do. His ability to survive and succeed long range depends on his willingness and ability to achieve goals.

No matter what your ultimate long-range bodybuilding goal is, you will find it easier to sustain the necessary motivation by setting and achieving realistic short-range goals. It is important for your motivation that you realize that gaining muscular bodyweight is negligible on a daily or weekly basis. What you can realistically expect to achieve workout to workout are strength increases.

If, in a given workout, you are able to curl a certain weight for a maximum of 10 reps, and the next workout you can curl it for 11 reps, that should motivate you. The fact that you increased your strength by even one rep means that there has been something added to your biceps. If they had remained the same, you would have only been able to curl that weight for 10 reps again.

6. *Knowledge, certainty and motivation*. As I discussed in chapter 1, prior to learning the theory of productive bodybuilding exercise, I seriously contemplated giving up my arduous quest for a championship physique. In my innocence and ignorance, I read muscle magazines on the implicit assumption that if something was printed it had to be true. With not the slightest inkling of the nature of theoretical knowledge and its role in man's life, I wasted more hours than I care to calculate engaging my blind passion in an endeavor that amounted

to endlessly pushing a rock up a hill, only to have it roll back down again. Just how long any individual will persevere in such a fruitless endeavor depends on how much self-esteem he has.

Theoretical knowledge is not the exclusive domain of ivory tower intellectuals, but is, in fact, a crucial necessity of man's proper survival. Every bit of your mental contents is derived from some theory, and your success and happiness hinge on whether it is true or false, good or evil.

The major philosophic theme of this book is that without a firm intellectual grasp of and guidance by a valid theory, one cannot be certain -- no matter what the field -- that he is on the right course. A sane individual, setting out on a trip from Los Angeles to New York, will consult a map, which is a form of theoretical knowledge. Without it, he would get lost, lose whatever certainty and motivation he may have had, and terminate his effort along the way.

Knowledge, like any other value, has to be gained through a volitional effort. Anyone smart enough to learn the ABCs, write a sentence or read a book can, with enough effort, integrate and make use of the knowledge contained in this book. If you don't get it all on the first reading, then re-read and re-re-read it until you do. I can assure you that the rewards -- self-esteem, certainty and motivation -- will be commensurate.

*Mike Mentzer poses for Russ Warner's camera backstage at the 1978 Mr. Universe, which he won with the only perfect score in history.*

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